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ABSTRACT

Presented are notes taken from a 6-week inservice training program for 30 teachers and 30 paraprofessionals who work with deaf-blind children. Entries are divided into two sections--lectures and minicourses--and include the following titles: "Piaget" (V. Robinson), "Dichotic Listening--Research and Applications" (B. Franklin), "Curriculum Ideas and Care of the Hearing Aid" (M. Zuehlendorff), "Parent Effectiveness" (S. Mouchka), "Development of Prelanguage Skills of Deaf-Blind Children" (M. Zuehlendorff), "Language, Nature, and Early Acquisition" (J. Eisenson), "Structured Natural Approach to Language" (E. Jackson), "The Ability to Communicate" (G. Attletweed), "Hearing Evaluation in a Program for Hearing-Impaired Infants and Young Children" (J. Lang), "The National Center for Deaf-Blind Youths and Adults" (V. Schiller), "Living Skills Center for the Blind" (P. Hatlen), "California Industries for the Blind, Inc." (L. Walker), "The George Miller Jr. West Multipurpose Center" (M. Greeley), "Mental Health Services for the Deaf" (K. Meadow), "The Teacher and the Researcher" (G. Abel), "National Trends and Priorities in Special Education" (P. Burke), "Closing Remarks" (J. Coker), "Prevocational Training" (C. Zemalis, et al.), "Cerebral Palsy, Motor Development, Recreation, and Leisure Activities" (M. Brown and S. Rudger), "Total Communication" (A. Towner), "Techniques of Counseling" (F. Dew), "Atypical Development" (C. Groves), and "Orientation and Mobility for Blind Children" (B. Wurzbarger and R. Richards). (SBH)

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Proceedings:

**Inservice Training Program for Teachers
and Aides of Deaf-Blind Children**

Summer, 1975

Offered at
SAN FRANCISCO STATE UNIVERSITY
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Foreword

Most educational endeavors do not make themselves clearly evident of success while the activity is in progress; however, when the activity starts to show signs of something dynamic occurring, then one should make the results available to others. Such an activity occurred in the summer of 1975 at San Francisco State University.

Barbara Franklin, Coordinator of the Inservice Training Program for Teachers and Aides of Deaf-Blind Children at San Francisco State University, during the summer of 1975 achieved in a matter of a few weeks what would normally take months to prepare. With minimum planning time but with a resourcefulness that is part of her character, Dr. Franklin brought together experts in many disciplines to present an educational program that proved successful beyond the expectations of the persons concerned with the initial planning. This became evident when the majority of the participants unreservedly praised the high level of training and the instruction.

As the training program was progressing, the plan to compile the information into one compendium was discussed. The contents and their immediate relevance to education of deaf-blind children everywhere became apparent. In each presentation quality was evident, and, when the product was seen as a whole, the final decision to publish this information was made.

In a publication such as this, information generally is intended for use by an esoteric group, usually teachers working with deaf-blind clients. In this instance that esoteric group will need to make room for others (parents, aides, psychiatric technicians, medical personnel, etc.) because the material may be utilized by anyone who has a need for information on the deaf-blind.

Noteworthy success has yet to be established in this growing field. The few short years of our efforts are still insufficient for us to declare our independence. Consequently, we must turn to established disciplines and allied categories in special education for qualified persons to provide us with answers we can generalize upon and apply to deaf-blind children. It is presumptuous for us to think that we in the field have the answers to the educational problems of the deaf-blind.

The reader will quickly discern that of the 27 presenters nine are directly involved with deaf-blind children, youth, or adults. The other presenters are peripheral personnel; i.e., in other categorical disciplines, but most important to us in providing us with a baseline knowledge of deafness, blindness, cerebral palsy, neurological dysfunctions, and emotional and mental handicaps. Therefore, articles that concern the "deaf" or the "blind," or methodology pertinent to those handicaps, must be considered as an introduction to the education of the deaf-blind today. Until research provides us with hard data relative to our present deaf-blind population or when concise and well-documented observations by teachers are published, our only alternative at the present is to use knowledge and information from other categories.

Since this is a relatively new category in special education, researchers are now in the early stages of recording and documenting behaviors that are unique to our deaf-blind population. We are now training and developing leaders who will in time provide us with a point of view that will find general professional acceptance. In the interim, these proceedings are a step toward providing us with helpful information.

William A. Blea
Project Director
Southwestern Region Deaf-Blind Center

Preface

In March, 1975, William Blea, Project Director of the Southwestern Region Deaf-Blind Center, in his letter announcing summer program plans, requested suggestions as to the types of training teachers and paraprofessionals were interested in.

The Southwestern Region Deaf-Blind Center entered into a contract with San Francisco State University (SFSU) to provide a six-week inservice training program -- June 23 through August 1, 1975 -- for 30 teachers and 30 paraprofessionals who work with deaf-blind children. The program, which consisted of lectures and a series of minicourses for six units of credit, was based on the responses to Dr. Blea's letter. The project director was Barbara Franklin, Coordinator of the Deaf-Blind Program in the Department of Special Education at SFSU.

Material was disseminated to personnel in the southwestern region, as well as to the regional coordinators of the deaf-blind so that they could inform interested individuals within their areas. Despite only three weeks' advance notice, the response to the offered program was overwhelming. Almost as many people were turned away as were accepted, due to space limitations. The 60 applicants who were selected represented 16 states including Hawaii, in addition to American Samoa and Guam.

Three trainees from the SFSU training program for teachers of the deaf-blind -- Julia Brackin, Pam Johnson, and Linda Tani -- were assigned as graduate assistants for the summer. In addition to taking the courses, they had a multitude of responsibilities, including taking attendance; acting as liaison between participants, speakers, and the project director; arranging car pools for field trips; handing out materials in class; and keeping participants informed of special activities and programs. In addition to all these duties, these three graduate students also undertook the mammoth job of extensive note-taking of every lecturer and speaker. These notes were written up, and the first drafts were submitted to Dr. Franklin for editing and organization. Each speaker was then sent a draft for review prior to submission of the final copy of the proceedings to Dr. Blea for publication. Some of the speakers indicated that the notes were sketchy, and they suggested that the reader might write a particular speaker to receive a more complete idea of the material presented.

Another SFSU graduate assistant, Dave Berman, was in charge of media. He was responsible for supplying the speakers with appropriate equipment as well as creating a pictorial record of the entire summer program through the use of videotapes and still photographs.

Barbara Franklin
Project Director and Coordinator,
Deaf-Blind Program,
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San Francisco State University

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Lectures

PIAGET

Presented by Violet B. Robinson
Professor, San Francisco State University

In presenting an overview of Piaget's theory (Piaget, 1970), it is important to note first that he distinguishes between two types of knowledge (experience):

a. Physical knowledge, which is knowledge of the physical world and the objects and events in the physical world. This knowledge is derived from actions on things -- touching, pushing, viewing, etc. -- and these actions give rise to the abstraction of the attributes of things. This kind of abstraction is an abstraction of the attributes of objects or events. That is, the child learns that an object is heavy by holding it; he learns that an apple is sweet by tasting it; he learns that a rock is smooth or rough by handling it. Here the information is drawn from the objects, and the child abstracts the attributes of the objects themselves; the attributes are part of the object. This kind of abstraction Piaget terms simple abstraction.

b. The second kind of knowledge Piaget distinguishes is that which he calls logical-mathematical knowledge. This kind of knowledge is the result of reasoning; it is knowledge that is derived from certain kinds of actions and a certain kind of abstraction. This kind of abstraction can best be explained by an illustration Piaget frequently uses. A mathematician friend of Piaget's told him about the following experience he had as a child. As a boy the mathematician was playing with some pebbles. He put them in a row horizontally, counted them, and found he had ten. Then he put them in a vertical arrangement, and, lo and behold, when he counted them again found that he had ten. Then he deliberately placed the pebbles in different arrangements -- circular, diagonal, etc. Each time he counted ten and discovered that, no matter how he arranged them, he always had ten. He discovered that the sum is independent of the order. This kind of knowledge did not come from the physical properties of the pebbles; neither the sum nor the order was an attribute of the pebbles. Rather, this kind of knowledge was derived from the actions he carried out on the pebbles. The knowledge came from reflecting back on his actions, not just the individual actions but on the coordination of his actions; that is, reflecting back not just on the individual action of arranging the pebbles in a horizontal row or a vertical row or in a circular fashion but on the coordination of these actions, the coordination of arranging them vertically, horizontally, and circularly, etc.

Actions can be coordinated in a number of ways; they can be joined together, they can succeed each other, they can correspond to each other, they

can intersect each other (Piaget, 1970). The first coordinations occur in infancy, when, for example, the infant joins the act of seeing with the act of grasping to grasp something he has seen or when he joins together the act of sucking and the act of grasping to suck something he has grasped. Piaget maintains that the forms of coordination of actions have parallels in logical structures and that such coordination of actions is the basis of the development of cognitive structures.

Cognitive structures develop as a result of the interaction of the child and the environment. We do not inherit cognitive structures; what we do inherit, according to Piaget, is a mode of intellectual functioning. Cognitive structures change as the child develops, but the mode of functioning does not. This mode of functioning has two characteristics: organization and adaptation. These two characteristics -- organization and adaptation -- are part of our biological nature (Flavell, 1963). All living things adapt to their environment (except some of my house plants). Adaptation includes two complementary processes: assimilation and accommodation.

Assimilation occurs when one incorporates something from the environment into his current structure. In his interaction with the environment, the individual organizes the objects and events according to his existing structures; thus, the individual perceives things in terms of already existing structures (for example, objects for the infant are things to be sucked). Accommodation occurs when a new experience does not fit with the existing structure. The structure then becomes modified in order to incorporate this new experience; the structure is modified as a result of making adjustments to the environment. Assimilation and accommodation are complementary processes. Some accommodation takes place as assimilation occurs because no two events are exactly the same.

The child, then, in interaction with the environment, develops psychological structures reflecting types of intelligence which differ at different periods of development. Piaget has identified four major periods of intellectual development.

I. Sensory-Motor Period

The first period is called sensory-motor and covers the period of birth to about 18 months to 2 years. During this period we see the development of the first structures which Piaget refers to as schemes. The sucking scheme, for example, begins with the reflex action of sucking. The infant first sucks the nipple of the breast or bottle and then extends the action to other things. Now sucking a nipple is a little different from sucking his fingers and both of these actions are different from sucking a blanket that rests on his chin; as the infant sucks different things, a generalizable aspect of sucking develops. This generalizable aspect of a type of activity is what Piaget means by a scheme.

Piaget delineates six stages of the sensory-motor period (Piaget, 1962). The first stage, lasting about a month, is that of reflex behavior. During the second stage, from about 1 to 4 months, there is the development of schemes concerned with sucking, seeing, hearing, vocalizing, and grasping; and some coordination of schemes begins here. Piaget also describes substages of each of these schemes, the first of which in each case is reflex action.

Visual Scheme - The development of the vision scheme proceeds from the reflex substage to the next substage in which the infant actively engages in "looking" behavior; he will look intently at stationary objects, staring at them, and attempting to follow them with his eyes when the objects are moved. He will stare at new objects in preference to familiar ones, but he will also smile at familiar objects. Piaget considers this smiling at objects to be the sensory-motor equivalent of recognition of an object, because as yet the object does not have permanence for the infant. (This will become clearer in a few moments when I talk about object permanence.) Next in the development of visual schemes comes the coordination with some other schemes, the sucking scheme for one. The coordination of reflex schemes occurs during the second and/or third substage of the sensory-motor period.

Hearing Scheme - At first the child (and this is in reference to a hearing child, as Piaget's children were) evidences an interest in sounds; for example, the infant will stop crying for a moment upon hearing a sound. During the second substage, there will be a prolonged interruption of the infant's activity upon hearing some sound. Next the coordination of the hearing scheme with others occurs, the coordination of vocalization and hearing, hearing and sight.

In the third substage of infancy, we see the beginning of intentional behavior, the intention originating after some accidental action. For example, the infant may be given a toy and exercises all the preceding schemes; that is, he looks at it, he sucks it, he shakes it; then accidentally he may rub it against the side of his crib, producing an unusual sound. The infant then will repeat this action, seemingly, with the intent to reproduce the sound. He appears to reproduce events that are interesting to him.

In the next two stages, new experiences are more fully explored with intentional behavior very evident; the child, for example, will try to grasp something and, if he cannot get it directly, he will try an intermediate means. In one of Piaget's examples, his daughter Jacqueline tried to grasp a cigarette case that had been entwined among the strings stretched across her crib which held hanging toys. When she could not get the case out by direct grasp, she looked in front of her, grasped the strings, pulled and shook them so that the cigarette case fell, and then she grasped it.

In addition to the development of action schemes, two other features of the sensory-motor period are particularly important in the development of cognition, that of object permanence and the process of imitation. In infancy an object is not something that is permanent to the child; in relation to objects, infancy is a state of "out of sight, out of mind." In the third stage of the sensory-motor period, the infant can recognize a partially hidden object; that is, in looking for an object that has been in his view and then partially hidden, he'll be able to recover the object. Next he will be able to recover a hidden object that has been hidden in a series of movements; for example, in hiding an object under a series of three pillows, if he watches you first put the object under the first pillow, then under the second, then under the third, the infant will be able to recover the object. At the end of the sensory-motor period, objects have permanence for the child.

Imitation proceeds from the infant imitating a model's (usually an adult) reproduction of a sound the infant himself has made; to imitating only what is familiar, only actions which he can do -- that are in his behavior; to immediate imitation of new actions in a trial and error way; next he appears to think about the action, he tries it out mentally, and then he reproduces the action; finally, the child can imitate a model who is not present. Now the child can imagine the model and imitate the model in the absence of the model; this is called deferred imitation and it is the beginning of the ability to represent mentally that which is not present. Heretofore the child only functioned in sensory-motor actions; he was tied to the present and action bound; now he can represent things mentally. This happens at the end of the sensory-motor period and marks the onset of the next period of development, the preoperational period.

Two Bill Keane Family Circus cartoons illustrate deferred imitation. In one, Dolly, a little girl, is trying to thread a needle. She says "Open wide," and her mouth forms the open position she desires of the eye of the needle. In another cartoon, Jeffy pulls the tablecloth with dishes on it off the table. In defense of his action he tells his irate mother that it did not happen that way when he saw the act on television; the dishes stayed on the table.

The ability to represent things and events which are absent in the perceptual field is what Piaget calls the symbolic function. The symbolic function represents reality rather than just acting on it as in the sensory-motor period. There are two kinds of symbols (Piaget refers to them as signs): images, as in deferred imitation, and words or other symbols such as numerals. The symbolic function develops during the preoperational period.

II. Preoperational Period

The preoperational period is from about 2 years to about 7 years of age. Piaget divides this period into two phases: the preconceptual phase and the

intuitive phase. In the preconceptual phase, from about 2 to 4 years, the child's concepts lack generality; the concepts are singular, more like an image. The child's concepts in this phase do not have stable identity; that is, an individual referent of a concept does not have a stable identity in different contexts or at different times; the child does not recognize the identity of the individual item in different contexts. Following are some examples Piaget gives to exemplify this lack of stable identity:

At 2; 11 (13) J. saw a photograph of herself asleep on my back and leaning against my shoulder (during a mountain walk). She asked anxiously: "Oh, what's that? (pointing to herself). I'm afraid of it. But who is it? Can't you see? -- Yes, it's me. Jacqueline's doing this (imitating the action)." when I showed J. another photograph of herself she said: "It's Jacqueline. -- Is it you or not? Yes, it's me, but what has the Jacqueline in the photo got on her head?" (Piaget, 1963, pp. 224-225)

Another Bill Keane cartoon is an example. Jeffy, looking at a photo of himself as a baby, asks if the head in the photo is his same head.

Another example from Piaget illustrates the lack of identity and generality of precepts:

...at about 2;6 J. used the term "the slug" for the slugs we went to see every morning along a certain road. At 2;7 (2) she cried: "There it is!" on seeing one, and when we saw another ten yards further on she said: "There's the slug again." I answered: "But isn't it another one?" J. then went back to see the first one. "Is it the same one?-- Yes -- Another slug? -- Yes. -- Another or the same? --..." The question obviously had no meaning for J. (Piaget, 1963, p. 225).

The intuitive phase is from about 4 to about 7 years of age, and here the child begins to be able to make what Piaget terms "regulations"; however, his thought is not yet reversible. A demonstration will make this point clearer. When a string of three beads is passed through a tube, the child will be able to predict the order of the beads coming out of the tube in a unidirectional form, but he cannot handle a 180 - or 360 - degree reversal. Thought in the intuitive phase is unidirectional.

Now let us look at some characteristics of the preoperational child, especially between 4 and 7 years of age.

1. The child's thinking is very concrete; the representations are close to overt actions, mentally parallel actions, so to speak; the beads and tube experiment is an example. Things are what they appear to be.
2. The child is, as in the sensory-motor period, egocentric, in that he can only see things from his own point of view or his own perspective. His understanding of events happening outside of himself is very limited and subjective. The following experiment by Piaget and Inhelder (1967) will illustrate. The child is presented with a cardboard model containing three mountains. Standing in front of the model (position A) the child sees a green mountain in the foreground and a little bit to his right; a brown mountain higher than the green one is to his left; and this mountain has a red cross on top of it. Looking toward the rear of this scene the child can see a third mountain, grey in color with a snow cap on the top, and it is the highest of the three mountains. If the child were standing opposite from his initial position (position C) he would see a zigzag path running down the side of the green mountain. If he were standing to the right of the model (position B), he would see a small stream of water running down the brown mountain. The child initially views the entire scene, and then, from position A, he is asked to reproduce with representative pieces of cardboard the view that a doll placed at different positions on the model would see. He is then shown some pictures of what the doll would see and asked to select the appropriate one for the particular placement of the doll. Thirdly, the child is asked to select a picture and then place the doll on the model where it would get the view of the picture. The preoperational child's reproductions are from his own position, position A. He cannot mentally place himself in the position of the doll. His thinking is from his own point of view; he cannot understand things from another point of view. His thinking is subjective, and an amusing example of this subjectivity is illustrated in a Family Circus cartoon:

The cartoon shows Jeffy coming back into the house, having missed the school bus. He advises his mother that the school bus missed him.

3. The preoperational child's thought is centrated, that is, the child's attention focuses on a single, striking feature of something, neglecting other important features, and, therefore, his reasoning is distorted. He attends to states and not the transformations that occur between states. You are probably all familiar with the widely cited Piagetian experiments on the conservation of matter and liquids. In our experiment a clay ball is elongated into a sausage-like form; the preoperational child will say that the sausage has more clay than the clay ball. In the other type of experiment, the child is shown two containers

of water, and then the water from one container is poured into another container of different shape, but containing the same quantity of water. If the second container into which the water is poured is thinner than the model, and therefore taller, the child will say that the second container has more water than the model; if the second container is wider, and therefore shorter, the child will say it contains less water. Here the child cannot recognize that quantity remains constant over changes or transformations; he cannot conserve the quantity over transformation because his thinking is not reversible; he cannot reverse to the original state and he cannot compensate; that is, he cannot understand the reciprocal aspect of changing two dimensions while holding an amount constant -- a change in the height of a container will require a corresponding change in width if it is to hold exactly and only the same amount of water. As one dimension declines, the other must increase if a constant amount is to be maintained. When the ball of clay gets longer, it must also get thinner. Another Family Circus cartoon shows an example of the pre-operational child who cannot conserve.

Jeffy's mother cuts the squash on his dinner plate into two pieces. Jeffy complains to his mother that now he has twice as much to eat.

4. The young preoperational child cannot classify. Piaget and his collaborator, Barbel Inhelder (Inhelder and Piaget, 1969), have done an extensive study of how classification develops in the child, and they found three stages. Here's an example of the first stage. The child is given an array of objects and is asked to put together the things that are alike. In the first substage, the child given an array of objects, in this case geometrical forms, aligns the objects in some linear fashion; each object is singular to the child and is only related to the next object to it. In the next substage, that of continuous alignments, the child makes the arrangement on the basis of successive similarities; he puts one down and then puts another one like it next to it; his criteria for arranging the objects changes as he proceeds. In the last substage of Stage 1, the child forms a complex object, based on geometrical symmetry or some situational content. He makes a geometrical pattern that is pleasing to him or some object, such as a house, he can describe. Here the child becomes fascinated with the whole and forgets about putting together objects that are similar.

In the next stage of classification, the child gradually develops the ability to group things together on the basis of some criterion of similarity that does not fluctuate. For example, the child will put all the squares together, or all the yellow objects, etc. However, there is one crucial aspect of classification that the preoperational child cannot yet do. This crucial aspect leads us to the next stage of classification, which is operational classification, where the child can function logically in relation to classes -- he can do class inclusion.

Class Inclusion -- Look around this auditorium and you will note that there are men and women here. Are there more women or more people in this room? Some of you may think such a question is ridiculous; obviously, there are more people because women and men are people. You see the logical necessity of this, but the young child does not. Given, for example, a class of toys, eight of which are small blocks and four of which are toy cars, and asked if there were more blocks or more toys, the preoperational child will answer that there are more blocks.

Recently, one of my graduate students, who teaches in a nursery school, reported the following anecdote:

Todd, four years and one month, had been with three other children and a teacher on a field trip. We returned to school too late for snacks so we were having our own at the snack table in the kitchen. I asked the children to count how many of us had missed snack so we would know how many cupcakes to put out. Todd counted carefully and said, "There are five people." I asked, "How many children are there?" Todd counted and said, "There are four children." I asked, "Are there more people or more children?" He said: "There are five people and four children and five is more than four but there are more children."

The reason for this kind of response is that the young child cannot hold the whole and the part in his mind simultaneously, and, therefore, what he does is compare the two subclasses or parts rather than compare the whole with the part. He is centrated on either the part or the whole. I have done research in this problem of class inclusion, investigating factors that may be facilitative and other possible factors in the problem, and if time permits later I shall share my findings with you. Let me say for now, though, that my results indicate, as Piaget found, that this class inclusion task is very difficult for the preoperational child.

Another problem of class inclusion that Piaget investigated was the child's ability to use logically the quantifiers all and some. Let me share with you another Bill Keane cartoon.

After being caught by his mother with his hand in the cookie jar, Jeffy tells her that his father said he could have some; then he asks his mother how much is some.

Jeffy's question is legitimate for a preoperational child, as he is, but here I suspect he is doing some quick thinking to get out of a bind. At any rate

Piaget found that the young child had difficulty with the quantifiers some, all, and none in logical tasks. At stage 2 of classification, the pre-operational child recognizes that there is a difference between all and some, but they do not have a meaning of some as part of the whole. Here is a response that was given for the meaning of some.

LIS (5;8) Counters: three blue circles and seven red squares. "Some blue ones (gives them all). Some squares (gives four and leaves three). Some red ones (gives three, after some hesitation). How can you tell what to do when I say some and what to do when I say all? Some means that it isn't a lot."

In relation to the word all, given a set of blue circles and a set of red squares, the older preoperational child finds the questions: "Are all the circles blue?" "Are all the squares red?" easier than, "Are all the blue ones circles?" and "Are all the red ones square?" Three and four year olds could not handle these questions at all.

5. Another characteristic of the preoperational child is that he reasons transductively; that is, from particular to particular.

A few years ago when I was teaching kindergarten, I introduced a unit on ships and the harbor. The children built garages for the ships out of blocks, including a garage similar to the Downtown Garage in San Francisco, a garage with spiral ramps. When asked why they thought garages were necessary, they responded: "To keep them in at night and when it's raining" -- never seeing the incongruity that a ship sails in water. Cars have garages, therefore ships have garages.

Jeffy, in another Family Circus cartoon, runs into the house to get something to write with for a game outside. Finding the pen chained to the wall, he asks his mother why it is so chained. He cannot see the relationship involved.

6. Another type of thinking Piaget observed in children concerns various aspects of the child's conception of the world. Listen to this statement made by Dr. Margaret Weymouth's grandson when he was four. He lives in Reno, and it was the first snow of that winter. He said: "Look, it's winter. I like the words of it. It calls itself snow and I call it snow too."

In another Bill Keane cartoon Dolly and Jeffy are picking flowers in a field and Dolly points out to Jeffy that "Weeds try to fool you by having flowers."

In both cases here, the child is attributing consciousness to inanimate

objects; this phenomenon is called animism or animistic thinking. In the first stage of animism the child thinks all things are conscious, as in the two previous examples. Here is an example of the second stage of animism; how is it different from the first?

KAE (11) "Does the sun know anything? Yes, it heats. Does a bicycle know when it goes? Yes, it feels the ground. Does a motor know when it goes? Yes, it feels it isn't still in the same place."

VOG (8;6) Does the wind know it blows? Yes, because it makes a lot of wind. Does a bicycle know when it's going? Yes. Because it can go fast. But stones, etc., neither know nor feel anything. (Piaget, 1963, p. 180.)

The second stage of animism -- things that can move are conscious.

The third stage of animism -- things that can move of their own accord are conscious.

The fourth stage of animism -- spontaneous movement. Consciousness is restricted to animals and is reached at about 11-12 years of age. A more recent study by Laurendeau and Pinard showed similar results, with the disappearance of animism occurring on the average at 9.6 years, but they also felt it might be higher if they had had an older sample.

Piaget also investigated children's responses to questions about the origin of natural phenomena such as the sun, the moon, stars, etc. Their responses in the first stage regarding this behavior indicated that they thought these phenomena were produced artificially by the actions of an outside agent. Piaget calls this artificialism. For example, in connection with the four quarters of the moon, one response was:

ROY (6;0) The moon has become a whole one. How? Because it's grown. How does the moon grow? Because it gets bigger. How does that come about? Because we get bigger What makes it get bigger? It's the clouds. (Roy said a little earlier that it is the clouds which cut the moon and make it into a crescent.) (Piaget, 1963, p. 258.)

After a group of kindergarten children were watching the wind on a very windy day, one child asked, "What makes the wind?" In discussing this question, the following notions were revealed: The wind comes from matches

being lit in the fireplace. The wind comes from pressure; pressure is a pusher-upper and one cloud gets in another and the pressure makes the wind. Fog makes the wind. The weatherman makes it.

Piaget acknowledges that children are not usually asked to think about such questions, but the protocol from my kindergarten class indicates that they may well think about such things and have questions about them. Piaget states that this kind of thinking exhibits a lack of differentiation and shows a kind of primitive participation the child establishes between things and man -- things grow because we grow; things began to live because we were made.

In the third stage of artificialism, origins of things such as the moon and sun are considered to be natural, in the sense of natural phenomena.

One last characteristic I would like to mention about the preoperational child is his understanding of relations, and I would like to briefly mention three kinds of relations. The first is seriation, the ability to order items in a graduated series, for example, from smallest to largest, from shortest to longest, from lightest to heaviest. The preoperational child has difficulty doing this, especially when having to anticipate it mentally. This age level child also finds it difficult to comprehend transitive relationships, that is: If A is bigger than B and B is bigger than C, then logically A is bigger than C. Finally, the preoperational child does not fully comprehend genealogical relations, as exemplified in another Family Circus cartoon.

The grandparents are visiting the family. Jeffy, watching his grandparents play with the other children, asks his mother how they got to know Grandma and Grandpa.

The young child may understand that he has a brother, but he does not recognize that he is his brother's brother. This understanding comes in the concrete operational period, which is the next period of development.

III. Period of Concrete Operations

The Period of Concrete Operations is from about 7 years of age to about 11 to 12. Now the child can function with mental operations in relation to concrete objects and situations. Operations are internalized actions, cognitive actions. The child is no longer centered and therefore he can attend to transformations as well as states. He can compensate when dimensions are changed as an amount is held constant, as in changing the clay ball to an elongated form. The principle of conservation gradually becomes manifested in the areas of substance, continuous quantity (that is, liquids), number, and weight. Thought now is reversible, and the child can hold the whole and the part in mind simultaneously. In the area of classification, the child can construct class inclusion; now he sees the logical necessity and will look askance

at you when you ask the class inclusion question. Piaget now considers that the child can form a logical class, rather than a mere collection. He can form hierarchical classes, both in an ascending way and a descending manner; that is, he can take an array of objects and classify them hierarchically up to the highest superordinate class, and he can start with the highest superordinate class and break it down into descending subclasses. He can order items in a graduated series, and he can comprehend transitive relations; that is, he recognizes that if A is bigger than B and B is bigger than C, then A is bigger than C. Genealogical relations also become better understood. It is not until 10 years of age that the child can solve the following problems in genealogical relations: Ernest has three brothers, Paul, Henry, and Charles. How many brothers has Paul? and Henry? and Charles? How many brothers are in this family? (Piaget, 1964)

Some animism also remains, as indicated earlier, until about the end of this period.

While the child in the period of concrete operations can reason logically about concrete things and situations, he cannot construct a range of hypothetical possibilities; that is, he can reason logically about the actual but not about the possible. The latter develops in the next period of development, that of formal operations.

IV. Period of Formal Operations

The period of formal operations is from about 11 or 12 years onward, and it is a period in which thought becomes freed from concrete situations and the individual can reason about the possible as well as the actual. Now, according to Piaget, the child is beginning to be able to handle propositional logic. At this point I must advise that this part of Piaget's theory is exceedingly complex because it concerns symbolic logic and, additionally, it concerns his system of symbolic logic. His system of symbolic logic has been criticized by symbolic logicians. There have been some studies which indicate that children in the concrete operational period can correctly reason in the "if, then" form of propositional logic and syllogistic reasoning (which is class logic).

An example of conditional reasoning is: If a Boston terrier is a dog, then a Boston terrier is an animal. A Boston terrier is a dog. Therefore, a Boston terrier is an animal.

Aristotle's classic example illustrates syllogistic reasoning: All men are mortal. John is a man. Therefore, John is mortal.

Piaget is not talking about the above kind of examples. When he talks about formal operations, he has reference to the individual working within a combinatorial system in which, for example, the individual can isolate

variables, hold one constant, and try a range of combinations. His combinatorial system is made up of sixteen combinations, which Piaget calls operations. Ennis (1975), in a recent article, delineates this system in a chart that is much simpler to grasp than Piaget's.

Method of Construction of Sixteen Combinations (Ennis, 1975).

1. a	9. bd
2. b	10. cd
3. c	11. abc
4. d	12. abd
5. ab	13. acd
6. ac	14. bcd
7. ad	15. abcd
8. bc	16. O for absence of element

Here, in the formal operational period, the individual can formulate hypotheses and test them based on all possible combinations in this combinatorial system. Here is what it looks like in an experiment by Piaget and Inhelder (1967). In one experiment, the child is shown four large bottles and a small one, each filled with colorless liquids. The liquids were then combined to produce a yellow color, and then another was added to remove the color. The children then were asked to reconstruct the experiment. Using the numbers 1, 2, 3, and 4 to identify the large bottles and the letter "g" to identify the small one and the sign "x" to stand for with, let us look at the performance of first a child in the concrete operational period.

KIS (9;6) begins with (3 x g + 1 x g + 2 x g + 4 x g), after which he spontaneously mixes the contents of the four glasses in another glass; but there are no further results. "O.K., we start over again." This time he mixes 4 x g first, then 1 x g: "No result." Then he adds 2 x g, looks and finally puts in 3 x g. "Another try (1 x g, then 2 x g, then 3 x g. Ah! (yellow appeared, but he adds 4 x g). Oh! So that! So that's (4) what takes away the color. 3 gives the best color." "Can you make the color with fewer bottles?" "No." "Try" (He undertakes several 2 by 2 combinations, but at random). (Inhelder and Piaget, 1958, pp. 114-115).

Here the child thinks he has solved the problem when he gets the correct answer by trial and error or, if he has a hypothesis, he will be satisfied

with one case as a proof of his hypothesis. In contrast, now let us look at the behavior of an adolescent working the same problem.

SAR (12;3) (He tries first with $4 \times 2 \times g$, then $2 \times g \times 4 \times g$) "Not yet. (He tries to smell the odor of the liquids, then tries $4 \times 1 \times g$) No yellow yet. Quite a big mystery! (He tries the four, then each one independently with g ; then he spontaneously proceeds to various two-by-two combinations but has the feeling that he forgot some of them.) I'd better write it down to remind myself: 1×4 is done; 4×3 is done; and 2×3 . Several more that I haven't done Ah! it's turning yellow. You need 1, 3, and the drops. But I want to try again; you can't ever be too sure...." (Inhelder and Piaget, 1958, pp. 116-117).

Here you see the adolescent working in terms of a hypothesis that he tests, considering every possibility, and then stating the principle. Here you see controlled, planned, abstract thinking combining possibilities. And now we have come to the achievement of logical thought, thought which has its roots in sensory-motor schemes.

The second part of the lecture consisted of a presentation and discussion of materials teachers might use in facilitating cognitive growth; the materials were concerned specifically with preclassification, classification, preseriation, and seriation.

Bibliography

Ennis, Robert H. "Children's Ability to Handle Piaget's Propositional Logic: A Conceptual Critique," Review of Educational Research, Vol. 45, No. 1 (Winter, 1975).

Flavell, John H. The Developmental Psychology of Jean Piaget. New York: D. Van Nostrand Co., Inc., 1963.

Inhelder, Barbel, and Jean Piaget. The Child's Conception of Space. New York: W. W. Norton & Co., Inc., 1967.

_____. The Early Growth of Logic in the Child. New York: W. W. Norton & Co., Inc., 1969.

_____. The Growth of Logical Thinking from Childhood to Adolescence. New York: Basic Books, Inc., 1958.

Piaget, Jean. The Child's Conception of the World. Totowa, N. J.: Littlefield, Adams & Co., 1969.

_____. Judgment and Reasoning in the Child. Totowa, N.J.: Littlefield, Adams & Co., 1969.

_____. The Origins of Intelligence in Children. New York: W. W. Norton & Co., Inc., 1963.

_____. Play, Dreams and Imitation in Childhood. New York: W. W. Norton & Co., Inc., 1962.

DICHOTIC LISTENING: RESEARCH AND APPLICATIONS

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Our knowledge of highly specialized functions of the brain has been significantly increased by recent dichotic listening studies. Dichotic listening is when both ears are stimulated simultaneously, but with different information going to each ear. This course includes: (1) an overview of the auditory pathway and the role of specific areas in dichotic (binaural) hearing; (2) a summary of dichotic listening studies relating to hemispheric dominance in the processing of auditory information; and (3) a presentation of current research investigating the difference in articulation scores resulting from the separation of low and high-frequency speech bands.

I. Overview

Let's consider, for a moment, the relationship between the physiological and the acoustic level. What happens at the acoustic level is a result of what happened at the physiological level. During phonation, the vocal cords open and close, producing a rich musical chord which is carried through the pharynx and larynx to the oral and nasal cavities.

As an example, let's look at the vowel / $\bar{e}$ /. The tongue constricts and, by assuming a specific shape, modifies the oral cavity. In this way, certain frequencies in the musical chord are emphasized. These concentrations of energy are called formants. The height of the tongue up and down in the mouth determines one formant, and the place of constriction front to back in the mouth determines another formant.

Let's follow this acoustic energy as it leaves the lips. Air consists of extremely small particles, over 400 billion billion per cubic inch. When we speak, the sound energy as it leaves the lips sets up a disturbance in the air. The particles move against each other, remaining substantially in their original position, so that the sound energy leaving the speaker's lips is carried as a wave through the air to the ear of the listener. The frequency of a sound wave is determined by the number of times per second a particle moves back and forth, and the intensity of a sound wave is determined by the size of the particle displacement.

The function of the outer ear -- the pinna and the canal -- is to collect the acoustic energy. The eardrum thus vibrates with the sound wave, changing the acoustic energy into mechanical energy. The mechanical energy is transferred from the eardrum to the oval window along the three bones (ossicles) of the middle ear. The middle ear performs its main function by increasing this energy through the lever action of the ossicles. As a result, the pressure at the oval window is approximately 35 times more intense than it was at the eardrum. The movement of the oval window is transmitted through the fluid of the snail-shaped inner ear (cochlea) to the organ of Corti, which extends the length of the 3 1/2 coils of the cochlea.

If the cochlea were unrolled, one would see four rows of hair cells, resembling bristles of a toothbrush. These hair cells, which are the auditory nerve endings, lie along the basilar membrane within the organ of Corti. Bending of the hair cells by the fluid movement within the inner ear results in an electrochemical discharge, thus changing the mechanical energy into nervous energy. Since the inner row of hair cells has a higher threshold than the three outer rows, the inner nerve endings are stimulated only by more intense sounds. All the hair cells are tuned to respond optimally to different frequencies, those closest to the oval window responding to high frequencies and those within the innermost coil responding to low frequencies. These nerve endings are laid out logarithmically, with approximately half the length of the basilar membrane responding to those frequencies below 2,000 cps, and the other half responding from approximately 2,000 - 20,000 cps. Thus the majority of hair cells are sensitive to those frequencies necessary to receive speech. Frequency is therefore related to the place of maximum stimulation of the basilar membrane. Intensity is related to the number of hair cells stimulated, since as the sound wave increases in intensity, more hair cells are stimulated.

Since the low-frequency sound wave must travel over the entire basilar membrane before it arrives at the low-frequency end, there can be "masking" of the high frequencies by the low frequencies. However, the high frequencies travel only a short distance from the oval window, never reaching near the apical end of the cochlea. Thus, the high frequencies cannot "mask" the low-frequency sounds. "Masking" can be explained as a "line-busy" effect. If the hair cells which respond to high frequencies are busy responding to a low-frequency sound, a high-frequency sound may not be able to get through.

The hair cells on the basilar membrane in the right ear connect to nerve fibers, which join together in a bundle to form the right branch of the

8th nerve, the auditory nerve, and the nerve fibers connecting to the hair cells in the left ear join together in a bundle to form the left branch of the auditory nerve. All the fibers enter the cochlea nuclei in the brain stem; the fibers from the right ear arrive at the cochlea nucleus on the right side of the brain, while those from the left ear arrive at the left cochlea nucleus. Damage to either nucleus at this level in the brain will cause a complete break in the auditory pathway from its associated ear, and no auditory stimuli from that ear will arrive at the cortex. A lesion at the level of the cochlea nucleus is equivalent to a peripheral hearing loss. In fact, the peripheral hearing mechanism is described by many as being the cochlea and the cochlea nucleus.

The auditory nerve leaves the cochlea nuclei and arrives at the superior olivary complex in the medulla. Each branch of the auditory nerve splits after leaving the cochlea nuclei, with some fibers arriving at the olives on the same side, and some fibers crossing over to the olives on the other side. A lesion at either olive, therefore, would not prevent auditory stimuli from reaching the cortex, as does a lesion at the cochlea nucleus level.

Goldstein and others in 1972 reported that they knew of no clinical instance in which a confirmed central nervous system lesion, even bilaterally, at any level, in the presence of a normal peripheral auditory mechanism, has led to a reliably measured impairment of auditory sensitivity.

The superior olivary complex comprises two separate bodies -- with a lateral superior olive and a medial superior olive on both the right and the left side.

Harris in 1974 described how each lateral superior olive (LSO) receives only monaural stimulation, but receives information from the cochlea via the cochlea nucleus from the entire length of the basilar membrane -- of the whole frequency range of low, middle, and high frequencies.

The medial superior olive (MSO) receives information binaurally -- there is input from both cochlea nuclei to each MSO -- but only information from that part of the basilar membrane that responds to low and middle frequencies is transmitted.

Dichotic stimulation is involved with localization of sounds in space and it is in the medial superior olives that information from both ears converges. Harris notes, however, that lateralization is at its best with high frequencies, and yet the medial olives do not receive high-frequency

information from the cochleas via the cochlea nuclei. Harris also comments that although "excitation of the lateral olives is from the ipsilateral ear only, contralateral stimulation in the same time period may influence response to ipsilateral stimulation. Inhibition is common, so that contralateral stimulation may inhibit spontaneous discharge, or reduce the outflow to ipsilateral stimulation." (p. 36)

The auditory pathway going from the cochlea up to the auditory cortex is an afferent system. Recently, several efferent systems have been discovered -- systems which seem to be involved in the auditory process, but travel in a downward direction. I do not want to leave the olives without commenting on the most well-known of these efferent systems -- the olivo-cochlear bundle (OCB), first described by Rasmussen (1960) and sometimes referred to as Rasmussen's bundle. There is both a crossed and an uncrossed component to the OCB, both originating in the olives on each side, and terminating in the cochlea. The pathway of the uncrossed OCB is from the olives to the cochlea on the same side, terminating under the inner hair cells. The pathway of the crossed OCB is from the olives over to the cochlea on the other side, terminating on the outer hair cells.

The physiological effect of the crossed OCB was shown to be inhibitory by Galambos (1956) who found reduction of the action potentials in the auditory nerve when the OCB was electrically stimulated. Desmedt (1962) showed the suppression to amount to as much as 25 dB.

Whitfield (1968) has suggested that it may be too elementary to consider the efferent system as one that inhibits the afferent system. Rather the OCB may in some way regulate the connections between the cochlea and the brain stem.

The auditory nerve fibers now travel from the olives to the inferior colliculus in the midbrain. There is some crossover of fibers at this level; however, the major point of crossover is at the olive level.

The nerves continue upward to the medial geniculate body located in the thalamus.

Finally, the two bundles of the 8th nerve arrive at their destination -- the fissure of Sylvius in Heschl's gyrus in the auditory cortex in the temporal lobe. It is here in the auditory cortex that meaning is given to sound. Although some aspects of auditory stimuli can be interpreted below the cortical level, the processing of speech and language requires cortical associations.

Wernicke's area, which is located in both hemispheres is responsible for the reception and interpretation of auditory stimuli. Broca's area is in the frontal lobe and is usually located in the left hemisphere. Broca's area is responsible for the verbal expression of language, and is usually referred to as the speech area.

I would like to present some physiological evidence of hemispheric specialization of brain function.

Geschwind (1972) examined 100 adult human brains on postmortem, and found the area behind Heschl's gyrus was larger in the left hemisphere in 65% of the subjects, and in the right hemisphere in only 11% of the subjects. Geschwind reported the following statistics for the general adult population regarding handedness and hemisphere dominance -- that 93% of all adults are right-handed, and 96% are left-brained for speech. He concluded that the left hemisphere is dominant for speech perception and expression.

McAdam and Whitaker at the University of Rochester reported the following in the April, 1971, issue of Science. Electrodes were placed over the inferior frontal sites of the left hemisphere, which is presumably Broca's area, and other electrodes were placed over the same area of the right hemisphere. When eight right-handed subjects were asked to spontaneously utter polysyllabic words, larger negative potentials were recorded from the left hemisphere. The authors stated that "these data provide the first direct physiological evidence for localization of language production functions in the intact, normal human brain." (p. 502)

Morrell at Stanford University Medical School and Salamy from U. C. Medical Center in San Francisco reported a study in the October, 1971, issue of Science. They also placed electrodes over the two hemispheres, and compared the average cortical potentials evoked by the sound of human speech. Again, the electrical responses were greater from the left hemisphere, particularly in the temporoparietal region where Wernicke's area has been located.

Direct electrical stimulation of different parts of the brain may indicate that the stimulus was received, but not necessarily that it was processed -- that it had any meaning for the subject. The rest of my talk therefore will concentrate on evidence of hemispheric specialization obtained from behavioral studies.

Kinsbourne (1972) at Duke University Medical Center reported an

interesting study in Science (May, 1972). He found that "when solving verbal problems, right-handed people usually turn head and eyes to the right, whereas with numerical and spatial problems, these people look up and left." (p. 539) Assuming that the direction of orientation indicates the laterality of cerebral representation, we confirm that, "in right-handers, language processes are lateralized to the left hemisphere, while spatial skills are more evenly distributed but are emphasized in the right hemisphere... Among left-handers, however, dominance of right and left hemispheres occurs with roughly equal frequency. The same seems to apply to numerical and spatial functions." (p. 54) "The results suggest that the direction in which people look while thinking reflects the lateralization of the underlying cerebral activity."

I would like to present the results of some of the studies reported in the book Brain Mechanisms Underlying Speech and Language, edited by Millikan and Darley, and published in 1967.

Sperry and Gazzinaga (1967) reported on several patients who had their two hemispheres surgically disconnected. Several tests involved pictures being flashed simultaneously, one to the left visual field and the other to the right visual field.

Each hemisphere receives auditory information from both ears, although more information is received from the contralateral ear. The eye functions in a completely different manner. The right half of each eye is represented only in the left hemisphere of the occipital lobe, and the left half of each eye is represented only in the right hemisphere.

I will describe the results of some of the split-brain tests which involved this technique of flashing pictures simultaneously to the right and left field.

1) Subjects could write or speak only about the pictures flashed to the right visual field. When the pictures were flashed to the left visual field, the subjects reported seeing nothing or only a flash.

2) Subjects were asked to reach under a shield and blindly search out from ten or more objects, the one he saw in the picture. This task was accomplished for both the right and left field presentations. Although the left field responses were correct, the subjects verbally denied having seen anything. I would like to add that the left hand had to be used to search for objects flashed to the left field, and the same for the right hand. In no instances did the cross combinations work.

It certainly appears that the minor hemisphere senses and perceives visual material, even though the subject may be unable to talk or write about the experience.

3) Another experiment involved stereognostic perception. Objects were placed in the subjects' hands, out of view. They were able to name and describe the objects placed in the right hand but not in the left hand.

4) A fourth experiment is of particular interest. The examiner named an object and the subject had to search it out from a group of objects placed out of his sight. The subjects could accomplish this task with both the right and left hand. The authors concluded that the minor hemisphere must have perceived and comprehended the examiner's verbal instructions, and that the minor, right hemisphere seems to be capable of some rudimentary verbal comprehension.

It would seem that these same techniques, which are used to determine abilities of patients with specific types of brain lesions, can be applied diagnostically to children with suspected central problems.

I will now discuss some recent research concerning the processing of auditory stimuli in the brain.

Luria (1970) presented a unique description of the functional organization of the brain. Within the area of the cortex, which receives sensory stimuli, there is a hierarchical organization. For the analysis of auditory stimuli, for example, there is a primary zone that sorts and records the information; a secondary zone that organizes the information further and codes it; and a tertiary zone where there is a synthesis of a collection of information from different sources into a coherent whole.

Repp (1975) stated that "Since in most people a significant part of the mechanism for perception and production of speech seems to be localized in the left hemisphere, the auditory stimuli processed separately by each hemisphere must eventually converge upon this unilateral mechanism in order for a response to occur." (p. 489) He then speculated on how much processing of the auditory stimuli actually occurs before central convergence in the left hemisphere. Studdert-Kennedy and Shankweiler (1970) found that both hemispheres are capable of extracting complex acoustic features from stimuli, such as rapid changes in pitch, duration, and loudness. Repp offers then, as one possibility, that all further auditory analysis is done only by the dominant hemisphere. Another possibility he offers is that the minor hemisphere is also capable of extracting phonetic features and that a feature list

is transmitted to the major hemisphere to be combined into phonemes and larger units.

Another possibility Repp offers would be supported by the split brain studies I mentioned earlier, that the minor hemisphere understands spoken language quite well, but that verbal responses seem to be strictly limited to the dominant hemisphere. There are two additional alternatives that could be considered:

- 1) That the minor hemisphere is capable of understanding relatively simple linguistic units, but the dominant hemisphere does all the processing and organizing of more complex linguistic material.
- 2) That each hemisphere is capable of a complete auditory analysis, and goes directly from each hemisphere to Broca's area in the dominant hemisphere for a verbal response, or to the parietal lobe in the dominant hemisphere for a written response.

II. Dichotic Listening Studies

The results of recent dichotic listening studies have increased our understanding of brain function and hemispheric specialization. The following review of the research on dichotic listening is by no means exhaustive. The studies cited, are, in some instances, representative of numerous similar investigations. When one ear outperforms the other on a dichotic listening task, this is referred to as a "superiority effect," a "laterality effect," or even just "earedness."

The earliest reference to a "superiority effect" was by Licklider (1948), who noted without further comment that "The average intelligibility scores were higher when the speech was presented to the listeners' right ears than when it was presented to their left ears." (p. 153)

Broadbent (1954) was the first to report on ear superiority. He was studying short-term memory in Naval recruits, and noted that when he presented two simultaneous sets of digits, one to each ear, there was a slight tendency for the right hear to do better than the left ear.

The earliest use of the dichotic technique was in auditory tests

designed to detect central hearing disorders. Bocca in 1954 noted that temporal lobe tumors are rarely characterized either by an increase of threshold for pure tones or by a lowering of speech discrimination scores. In designing a test to be used to diagnose central auditory disorders, Bocca and his associates made two assumptions: first, that the speech signal would be more difficult to understand if its redundancy was reduced, and second, that the degraded speech signal would require more integrative functions which were located in the areas of the brain they wanted to investigate. There are many techniques for reducing the redundancy in the speech signal, including: acceleration, interruption, filtering, and competing signals.

Matzker in 1962 reported on his approach to evaluate central auditory function. This was one of the earliest dichotic listening tests, and was based on the principle of binaural fusion. He filtered German PB words into two bands: a low-pass band of 500 - 800 Hz, and a high-pass band of 1,815 - 2,500 Hz. Neither band alone contained enough information for discrimination, but when the low-pass band was sent to one ear and the high-pass band to the other, the normal brain fused the signals, and recognition of words resulted. Patients with brain lesions achieved lower scores when the bands were split to opposite ears than when both bands were sent to the same ear because of their failure of bilateral integration.

Hayashi in 1966 improved on Matzker's technique and compared the difference in the subject's scores when a high band and a low band were presented to both ears and when the bands were split, one to each ear. In this dichotic listening task, scores were reduced when the high band was sent to the ear contralateral to the lesion.

Similar results were reported by Calearo (1957) using Italian PB words, Linden (1964) using Swedish spondees, Jerger (1960) using English PB words, and Palva (1965) using Finnish PB words.

Kimura (1961 a,b) and Milner (1962) were the first to investigate the phenomenon of "ear superiority" in normals. They found that subjects perceived verbal material better with the right ear than with the left ear. The superiority of the right ear was most evident in a dichotic listening situation where there are competing stimuli, each ear receiving a different signal. The authors offered as an explanation of this phenomenon that the crossed fibers leaving the cochlea have been found to be more effective than the uncrossed fibers so that each temporal lobe receives maximum stimulation from the contralateral ear. Milner (1968) cited evidence that in dichotic

listening the ipsilateral auditory pathways tend to be suppressed, so that the stimuli are channeled via the contralateral pathways to separate hemispheres. In the majority of cases, the left temporal lobe is the dominant lobe for speech reception. Kimura noted that for those individuals who had speech reception in the right hemisphere, there was indeed a "left-ear" superiority in the reception of verbal material.

There is a growing body of evidence that dichotic listening tests can be used to assess the integrity and function of the normal human brain. By inference, one can conclude that when there is a significant difference in the right and left-ear test scores, the brain hemisphere which is contralateral to the ear demonstrating a superiority effect is specialized for processing that type of auditory information.

Studdert-Kennedy and Shankweiler, in their 1970 J.A.S.A. article, "Hemispheric Specialization for Speech Perception," stress a critical point: "The size of the laterality effect is not a measure of its importance or of its value for research. We are not concerned in dichotic experiments to estimate the contribution of a variable to control over perception. We are, rather, exploiting the apparently trivial errors of a system under stress to uncover its functional processes." (p. 592)

Because the measurable difference between the ears in these experiments is relatively small, it is particularly essential to carefully control the variables. I will now discuss some of the possible variables.

In dichotic listening tasks it is critical that the onset times of the competing stimuli are accurately controlled. Berlin and Lowe (1972) have reported a "lag effect" in dichotic listening tasks, which occurs when there is a delay in the presentation of the stimuli to the two ears. When one word leads the other word by 30 - 90 msec, the lagging word is more often correctly identified. This is true for both the right and left ear, although the right ears tend to do slightly better. However, in the monotic mode -- both signals to the same ear -- just the reverse occurs. At these same time delays of 30 - 90 msec the leading ear achieves the higher scores. The "lag" effect in the dichotic mode disappears when the delay is greater than 90 msec, so that the first word "in" is the first one "out."

Intensity is another variable which requires attention in dichotic listening tasks. Berlin and Lowe (1972) reported that at higher intensities, above 50 dB, an increase of more than 10 dB to the left ear will usually result in a left-ear advantage for syllables, whereas when the stimuli are

presented at lower intensities, even a 5 dB increase can result in a left-ear advantage.

Studdert-Kennedy and Shankweiler (1970) reported that initial stop consonants of dichotic pairs of CVC syllables which share a feature of voicing or place are more likely to be perceived both correctly than pairs of consonants which do not. They found that there was a greater advantage to shared place than shared voicing.

Lowe, et al. (1970) reported a new effect -- voiceless consonants were more intelligible than their voiced counterparts, in both the right and left ears. In fact, the right-ear effect could be overcome by putting voiceless consonants in the left ear and voiced consonants in the right ear. In the monotic mode, this difference was greatly reduced, and even reversed in some instances.

Goldstein (1974) commented that "subjects' performance on the dichotic listening task may reflect a number of psychological and physiological factors, in addition to a possible cortical hemispheric specialization for language. Among the factors considered are attention (of an involuntary sort) and spatial orientation mechanisms normally involved in sound localization and binaural fusion."

Another variable reported is the mode in which the subject responds to the dichotic listening task. Clark, et al. (1970) reported that in recalling the second digit heard, there were higher scores when the subject wrote the answers down than when the subject spoke the answers. She suggests a possible interference by the vocal channel with the auditory channel.

Springer reported at the April, 1973, Acoustic meeting that reaction time measures can provide additional information about underlying processes. Subjects had to depress a button for designated syllables presented dichotically. Reaction times were shorter for right-ear responses.

Just in case you're not thoroughly confused by now, the following studies present conflicting results concerning hemispheric specialization for processing specific kinds of auditory stimuli.

Cutting (1972) at Haskins Labs examined the stops /g/ and /k/, the liquids /l/ and /r/, and the vowels /e/ and /ae/. He found a right-ear advantage for all three classes of phonemes, with the largest right-ear effect seen for the plosives, followed by the liquids, and the vowels, last. However, it is important to note that he did find a right-ear effect for the vowels.

Studdert-Kennedy and Shankweiler (1970) reported a significant right-ear advantage for the six stop consonants, in the initial position. They found an insignificant right-ear advantage for six vowels, and a significant right-ear advantage for the articulatory features of voicing and place of production. The authors suggest that the "continuous" nature of the vowels may not require the discrete feature analysis by the dominant hemisphere. However, they feel that there is a transfer of the vowel information processed in the nondominant hemisphere to the dominant hemisphere before the final perceptual response is made.

Spellacy and Blumstein (1970) concluded that the steady-state vowels can be perceived either in a speech or nonspeech mode -- that dichotically presented vowels will give either a left-ear advantage or a right-ear advantage depending upon whether the text context induces subjects to listen for speech or nonspeech stimuli.

Muraski and Sharf (1973) reported at the April, 1973, Acoustic meeting that when stop bursts were presented dichotically, subjects identified them correctly more often with the right ear when they were labeled as speech sounds, and more often with the left ear when they were labeled as noises.

Kimura (1964), Chaney and Webster (1966), and Curry (1967) showed that for nonspeech material, such as musical melodies and environmental sounds, dichotic presentation results in a left-ear superiority. There seems to be a growing body of evidence that perception of auditory temporal patterns depends more upon right-hemisphere mechanisms than upon left.

Rosenzweig (1954) compared cortical activity when clicks were presented monaurally and simultaneously to both ears. The evoked cortical responses were larger at the contralateral hemisphere in the monaural presentations. However, when the clicks were presented dichotically, at equal intensity, the subject lateralized the sound to the median plane, and the cortical activity was usually equal at the two hemispheres. There does not seem to be hemispheric specialization for clicks.

A very interesting study was reported in Science in August, 1974, by Bever and Chiarello, at Columbia University. They noted that the conclusion that speech is specialized in the left hemisphere and music in the right hemisphere is "simplistic since they do not consider the different kinds of processing strategies that listeners use as a function of their musical experience." (p. 538) They reported that musically experienced listeners recognize simple melodies better in the right ear than in the left, while the reverse is true for naive listeners. Bever and Chiarello concluded that their results of music

perception support the hypothesis that the left hemisphere is dominant for analytic processing and the right hemisphere for holistic or synthetic relations.

Van Lancker and Fromkin (1972) reported that for a group of Thai speakers there was a right-ear preference for pitch stimuli only when the contrasting pitches represented linguistic "tones." Otherwise, there was the expected left-ear preference for nonlinguistic pitch.

Benson, et al. (1972) concluded that when a pitch contrast had linguistic significance, such as in Cantonese, these tones were not perceived in either a linguistic or musical mode exclusively, since no ear superiority was evident in his study.

Smith and Shand (1974) reported no ear advantage in the dichotic perception of lexical tones for speakers of Cantonese. However, they did find a left-ear advantage for these same lexical tones for non-Cantonese speakers.

Nagafuchi (1970) studied laterality effects in children. He found girls showed a larger right-ear advantage for speech than boys at age 3, but by the age of 6 the sex difference disappeared. This supports the basic principle that girls develop language and speech skills earlier than boys.

Knox and Kimura (1970) also studied the right-ear effect in children, ages 5 - 8, for both verbal and nonverbal environmental sounds. Both sexes showed the expected right-ear superiority for speech, and the left ear for the nonverbal stimuli. An interesting finding was that boys correctly identified more nonverbal sounds than did the girls.

Molfese at the December, 1972, Acoustic meeting interpreted the results of his research "as support for the notion that the brain is specialized to process language and music differentially from birth and that this lateralization of function actually decreases with age."

III. Current Research

For the final section of this course, I will present the results of two of my own experiments using the dichotic listening technique (Franklin 1969, 1972).

I filtered the Fairbanks Rhyme Test into 2 passbands: a low band

(LB) of 240 - 480 Hz. and a high band (HB) of 1,020 - 2,040 Hz. For those of you who may not be familiar with this test, the subject is presented, for example, with ot, and has to fill in the initial consonant he hears. This is an open-response test since there are many alternatives, such as got, hot, lot, rot, pot, etc.

In the first study, I presented the HB alone to one ear of 36 normal-hearing subjects. This band was presented at threshold for all conditions. The LB was added at threshold, 20 dB, or 40 dB, to either the same ear receiving the HB or to the opposite ear.

Figure 1 compares the scores when the LB and HB were presented to the same ear -- the dotted line -- and when the bands were split, one to each ear -- the solid line. The average consonant-recognition score was 40% when the HB was presented alone to one ear. The LB contains negligible information when presented alone, at each of the 3 sensation levels. However, when the LB was added at threshold to either the same ear or to the ear opposite that receiving the high band, the score increased by approximately 14%. An additional increase of about 8% was obtained when the LB was added to the HB at 20 dB SL, to either the same or opposite ear. This total increase in the recognition score, from 40% to 62%, indicates that the LB contains useful consonant information. The recognition score dropped, however, to 38%, when the LB was added to the same ear at 40 dB SL, but only a slight drop, to 54%, occurred when the LB was presented at this intensity to the opposite ear. Evidently, the masking of speech by speech can be reduced by presenting the LB and HB to opposite ears.

Figure 2 shows the results for 6 hearing-impaired subjects who received stimuli under conditions similar to the first study, except that 10 dB was added to all presentations since this group had difficulty listening at threshold. All 6 subjects had moderate to severe, binaural, congenital, sensorineural hearing losses.

When the HB was presented at 10 dB above threshold to their better ear, the average recognition score for initial consonants was 36%. The average consonant recognition scores did not change when the LB was added to the same ear receiving the HB. When the HB and LB were presented to opposite ears, however, there was a significant increase in the scores ($p < .05$) for each of the 3 LB sensation levels. It is interesting to note how well the hearing-impaired subjects performed at near-threshold intensities.

There was a consistency of responses for all 6 subjects. When the bands were presented to opposite ears, there was an improvement from the

ARTICULATION SCORES

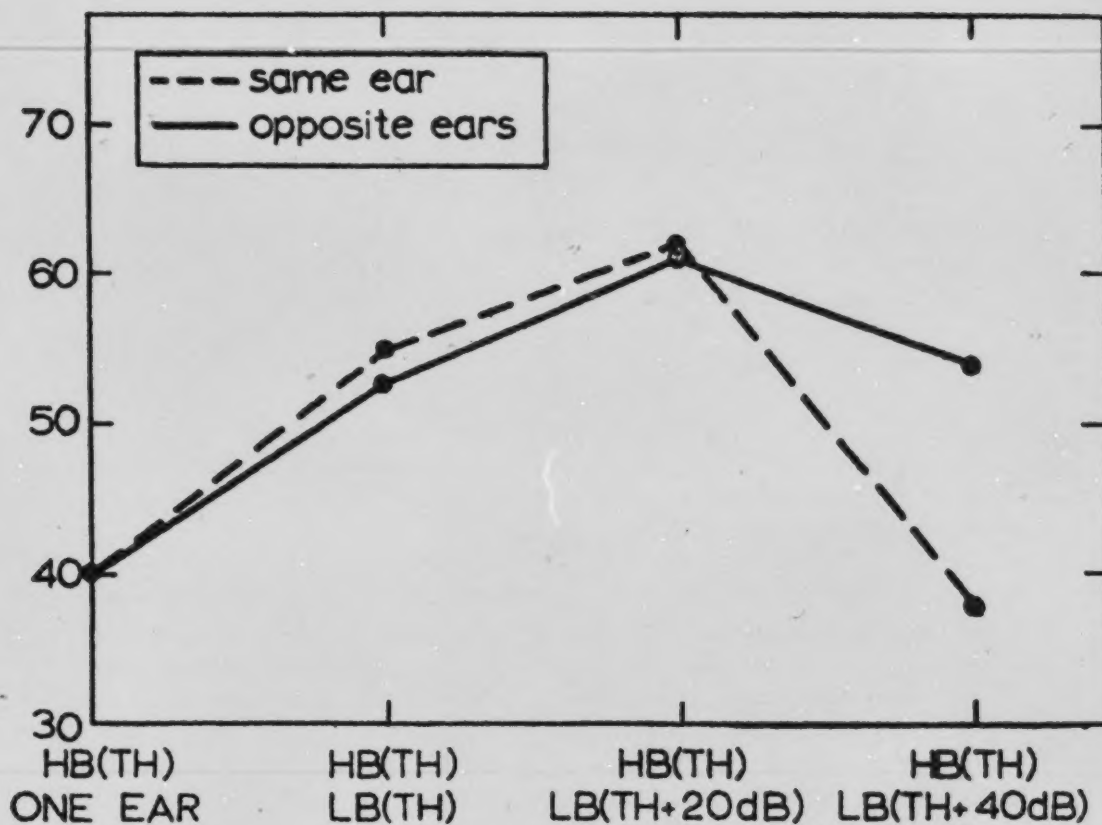


Figure 1. Normal-hearing subjects

ARTICULATION SCORES

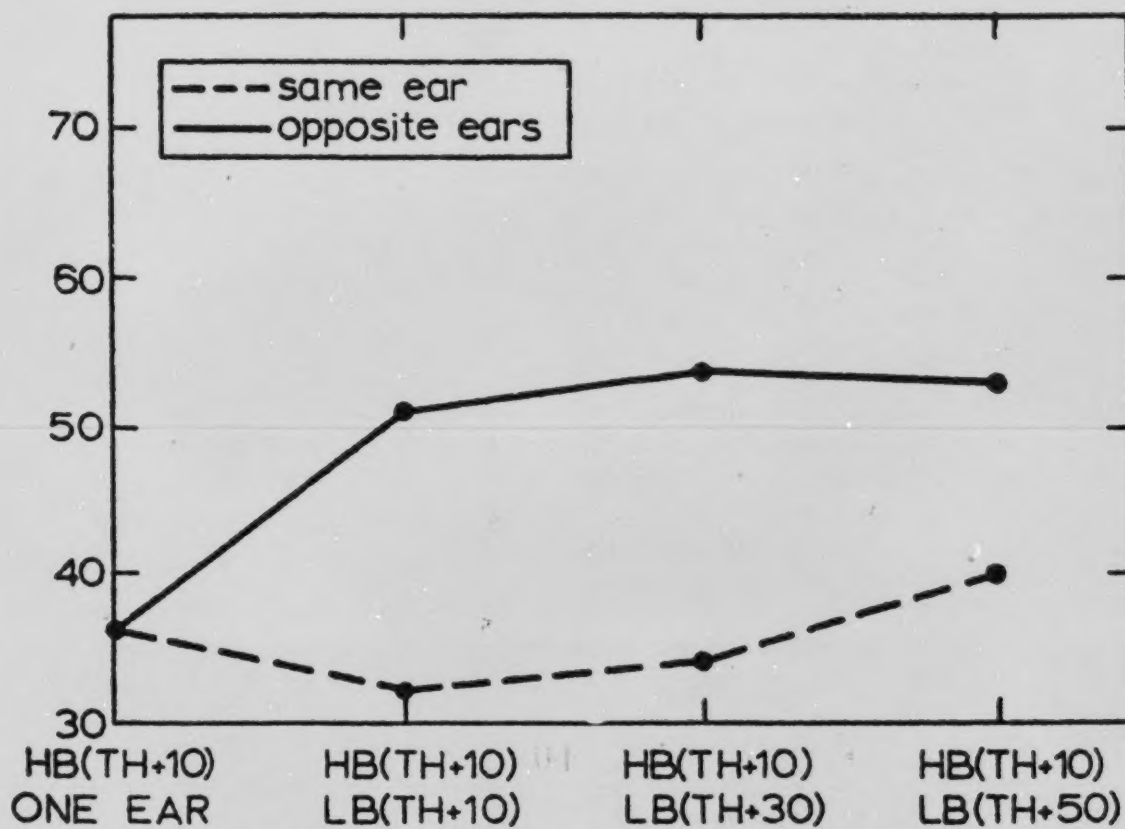


Figure 2. Hearing-impaired subjects

HB-alone score for each list, for all listening conditions. This study included subjects with both "flat" and "sloping" audiograms, and the same pattern of responses occurs for each subject despite the different hearing-loss configurations.

The scores for the normal-hearing subjects were substantially the same when the LB was added at threshold or 20 dB, to either the same or opposite ear as the HB. The scores for each of the hearing-impaired subjects, however, were consistently higher when the bands were presented to opposite ears than when they were added to the same ear, at each LB sensation level.

Eighteen of the normal-hearing subjects received the HB in the right ear, and the other 18 received the HB in the left ear. There was a significant right-ear superiority in 5 conditions ($p < .05$) -- HB alone, LB added at threshold to the same or opposite ear, and the LB added at 40 dB to the same or opposite ear. The right-ear effect was not found for the 2 conditions when the LB was added at 20 dB; this could possibly be a result of the relative ease of this listening condition.

I compared the right- and left-ear scores for the normal group for each consonant in the HB-alone condition. Of the 13 consonants examined, only /b/ was neutral in terms of earedness, and 11 consonants showed a marked right-ear effect. The /w/ showed a slight left-ear advantage, which is interesting to note since the /w/ is a semivowel.

I analyzed the correct responses for the normal-hearing group for each consonant. The voiceless stops /p/, /t/, and /k/ have a very similar pattern, with the maximum score occurring when the LB is added at 20 dB. When the LB is added at 40 dB to the opposite ear, there is only a slight decrease from the maximum score, but when added to the same ear there is a substantial drop.

The most noticeable feature of the voiced stops /b/, /d/, and /g/ is the great dissimilarity in their pattern, in sharp contrast to the consistency of the voiceless stop patterns.

The nasals /m/ and /n/ behave very much like the voiceless stops. It is interesting to note that the /l/ behaves more like the nasals than the Whirllys.

The /w/ has the highest score of all the consonants examined. There is a dramatic drop of 59% points when the LB is added at 40 dB to the

same ear as the HB, but only a slight drop is noted when added to the opposite ear.

I then analyzed the correct responses for the hearing-impaired group. For each consonant examined, the scores were consistently higher when the bands were split, one to each ear, than when the bands were sent to the same ear. Of particular interest is the 37% improvement in the /s/ score when the LB and HB are added to opposite ears, since most of the acoustic energy in /s/ is above 3,500 Hz.

Danaher and Pickett (1972) reported a masking of certain synthetic second formant vowel transitions by first formant transitions or first formants. They noted that, in certain subjects with sensorineural hearing loss, there is a reduction in the "masking effect" when the first and second formants are presented to opposite ears.

I also analyzed the perceptual confusions for each consonant. Most of the errors were place errors, some manner errors, and no voicing errors. It is significant that, with very few exceptions, the same pattern of perceptual confusions occurred with both the normal-hearing and hearing-impaired groups.

The following quote is from my own article, which has just been accepted for publication by the Journal of Speech and Hearing Research:

"Certain congenitally deaf and hard-of-hearing children might improve in their use of residual hearing if they wore an extended low-frequency-range hearing aid in one ear, and a standard aid in the other ear. This type of amplification would provide the individual with the information present in the low frequencies, and might reduce the monaural 'masking effect' of the low frequencies. Unless otherwise indicated, the left ear should be fitted with the low-frequency response aid, and the right ear with the standard response aid. The theoretical rationale for this approach is suggested by current research which notes that the left hemisphere of the brain is dominant for consonant discrimination, and the right hemisphere of the brain is dominant for the suprasegmental features of language, including pitch and intonation. The difference in the effect of the addition of the low band on the high-band scores in the two groups suggests that one cannot automatically apply data obtained on a normal hearing mechanism to a defective hearing mechanism. There is a need for additional research on the processing of auditory information by the congenitally hearing-impaired, and the appropriate amplification for this group."

I would like to conclude my part of the program with a quote from

Chapter 3 of the new book by Jerry Northern and Marion Downs, Hearing in Children: "...so long as clinicians continue to look at the child with central auditory problems only in terms of his behavior on standard speech and auditory tests, no progress will be made in developing strategies to ameliorate the problems." (p. 88)

I hope that this course was a tiny step in that direction.

Bibliography

Benson, P., T. Smith, and L. Arreaga. "Dichotic Perception of Lexical Tone by Speakers of Cantonese and English." Paper given at the Acoustic Society of America Meeting, Miami Beach, December, 1972.

Berlin, C., and S. Lowe. "Differential Diagnostic Evaluation: Central Auditory Function," Handbook of Clinical Audiology. Baltimore: Williams & Wilkins Co., 1972.

Berlin, C., and others. "Speech Perception After Hemispherectomy and Temporal Lobectomy." Paper presented at Speech Communications Seminar, Stockholm, August, 1974 (Proceedings, in printing).

Bever, T., and R. Chiarello. "Cerebral Dominance in Musicians and Nonmusicians," Science, Vol. 185 (August, 1974).

Bocca, Calearo, and Cassinari. "A New Method for Testing Hearing in Temporal Lobe Tumours," Acta Otolaryngol., Vol. 44 (1954).

Broadbent, D. "The Role of Auditory Localization in Attention and Memory Span," J. Exp. Psychol., Vol. 47 (1954).

Calearo. "Binaural Summation in Lesions of the Temporal Lobe", Acta Otolaryngol., Vol. 47 (1957).

Chaney, R., and J. Webster. "Information in Certain Multidimensional Sounds," J. Acoust. Soc. Amer., Vol. 40 (1966).

Clark, L., J. Knowles, and A. Maclean. The Effects of Method of Recall on Performance in the Dichotic Listening Task, 1970.

Curry, F. "A Comparison of Left-handed and Right-handed Subjects on Verbal and Nonverbal Dichotic Listening Tasks," Cortex, Vol. 3 (1967)

Cutting, J. "A Preliminary Report on Six Fusions in Auditory Research." Status Rep. Speech Res., Haskins Laboratories, SR-31/32, 1972.

Danaher, E. M., and J. Pickett. "Monaural and Binaural, Low-Frequency Masking Effects." Paper given at the American Speech and Hearing Association Convention, San Francisco, November, 1972.

Denes, P., and E. Pinson. The Speech Chain. New York: Doubleday & Co., Inc., 1973.

Desmedt, J. "Auditory-Evoked Potentials from Cochlea to Cortex as Influenced by Activation of the Efferent Olivo-Cochlear Bundle," J. Acoust. Soc. Amer., Vol. 34 (1962).

Franklin, B. "The Effect of a Low-Frequency Band (240 - 480 Hz) of Speech on Consonant Discrimination in Hearing-Impaired Subjects." Paper given at the American Speech and Hearing Association Convention, San Francisco, November, 1972 (submitted for publication).

Franklin, B. "The Effect on Consonant Discrimination of Combining a Low-Frequency Passband in One Ear and a High-Frequency Passband in the Other Ear," J. Aud. Res., No. 9 (1969).

Galambos, R. "Suppression of Auditory Nerve Activity by Stimulation of Efferent Fibers to Cochlea," J. Neurophysiol., Vol. 19 (1956).

Geschwind, N. "Language and the Brain," Scientific American, Vol. 226, No. 4 (April, 1972).

Godfrey, J. "Perceptual Difficulty and the Right-Ear Advantage for Vowels." Paper given at the Acoustic Society of America Meeting, Boston, April, 1973.

Goldstein, L. "Sideways Look at Dichotic Listening." Paper given at the Acoustic Society of America Meeting, New York City, April, 1974.

Goldstein, R., C. McRandle, and L. Rodman. "Site of Lesion in Cases of Hearing Loss Associated with Rh Incompatibility: an Argument for Peripheral Impairment," J. Speech Hear. Dis., Vol. 37, No. 4 (November, 1972).

Harris, J.D. The Electrophysiology and Layout of the Auditory Nervous System. New York: The Bobbs-Merrill Co., Inc., 1974.

Hayashi, Ohta, and Morimoto. "Binaural Fusion Test: A Diagnostic Approach to the Central Auditory Disorders," Int. Audiol., Vol. V, No. 2 (June, 1966).

Hershkowitz, R., and N. Durlach. "Interaural Time and Amplitude for a 500-Hz Tone," J. Acoust. Soc. Amer., Vol. 46 (December, 1969).

Jerger, J. "Observations on Auditory Behavior in Lesions of the Central Auditory Pathways," Arch. Otolaryngol., Vol. 71 (1960).

Kimura, D. "Cerebral Dominance and the Perception of Verbal Stimuli," Canad. J. Psychol., Vol. 15 (1961).

Kimura, D. "Left-Right Differences in the Perception of Melodies," Quart. J. Exp. Psychol., Vols. 15-16 (1963-64).

Kimura, D. "Some Effects of Temporal-Lobe Damage on Auditory Perception," Canad. J. Psychol., Vol. 15 (1961).

Kinsbourne, M. "Eye and Head Turning Indicates Cerebral Lateralization," Science, Vol. 172 (April, 1971).

Knox, C., and D. Kimura. "Cerebral Processing of Nonverbal Sounds in Boys and Girls," Neuropsychologia, Vol. 8 (1970).

Licklider. "The Influence of Interaural Phase Relations Upon the Masking of Speech by White Noise," J. Acoust. Soc. Amer., Vol. 20 (March, 1948).

Linden. "Distorted Speech and Binaural Speech Resynthesis Tests," Acta Otolaryngol., Vol. 58 (1964).

Lowe, S., and others. "Perception of Simultaneous Dichotic and Monotic Monosyllables," J. Speech Hear. Res., Vol. 13, No. 4 (December, 1970).

Luria, A. "The Functional Organization of the Brain," Scientific American, Vol. 222, No. 3 (March, 1970).

McAdam, D., and H. Whitaker. "Language Production: Electroencephalographic Localization in the Normal Human Brain," Science, Vol. 172 (April, 1971).

Matzker. "The Binaural Test," Int. Audiol., Vol. 1, No. 2 (September, 1962).

Millikan, C., and F. Dörley. Brain Mechanisms Underlying Speech and Language. New York: Grune and Stratton, Inc., 1967.

Milner, B. "Laterality Effects in Audition," Interhemispheric Relations and Cerebral Dominance. Edited by V. Mountcastle. Baltimore: Johns Hopkins Press, 1962.

Milner, B., L. Taylor, and R. Sperry. "Lateralized Suppression of Dichotically Presented Digits After Commissural Section in Man," Science, Vol. 161 (1968).

Molfese, D. "Cerebral Asymmetry in Infants, Children and Adults: Auditory Evoked Responses to Speech and Music Stimuli." Paper given at the Acoustic Society of America Meeting, Miami, Fla., December, 1972.

Morrell, L. and J. Salamy. "Hemispheric Asymmetry of Electrocortical Responses to Speech Stimuli," Science, Vol. 174 (October, 1971).

Muraski, A., and D. Sharf. "The Effect of Varying Labels on the Identification of Speech and Nonspeech Stimuli Presented Dichotically." Paper given at the Acoustic Society of America Meeting, Boston, April, 1973.

Nagafuchi, M. "Development of Dichotic and Monaural Hearing Abilities in Young Children," Acta Otolaryngol., Vol. 6 (1970).

Northern, J., and M. Downs. Hearing in Children. Baltimore: Williams & Wilkins Co., 1974.

Palva. "Filtered Speech Audiometry, I Basic Studies with Finnish Speech Towards the Creation of a Method for the Diagnosis of Central Hearing Disorders," Acta Otolaryngol. Supplementum, Vol. 210, No. 3 (1948).

Rasmussen, G. "Efferent Fibers of the Cochlear Nerve and Cochlear Nucleus" in Neural Mechanisms of the Auditory and Vestibular Systems. Edited by G. Rasmussen and W.F. Windle. Springfield, Ill.: C.C. Thomas, Publisher, 1965.

Repp, B. "Dichotic Forward and Backward Masking Between CV Syllables," J. Acoust. Soc. Amer., Vol. 40 (1975).

Rosenzweig, M. "Cortical Correlates of Auditory Localization and of Related Perceptual Phenomena, J. Comp. Physiol. Psychol., Vol. 47 (1954).

Smith, T., and M. Shand. "Dichotic Perception of Initial Consonants and Lexical Tone in Cantonese." Paper given at the Acoustic Society of America Meeting, New York City, April, 1974.

Sparks, R., H. Goodglass, and B. Nickel. "Ipsilateral vs. Contralateral Extinction in Dichotic Listening Resulting from Hemispheric Lesions, Cortex, Vol. 6 (1970).

Spellacy, F., and S. Blumstein. "The Influence of Language Set on Ear Preference in Phoneme Recognition," Cortex, Vol. 6, No. 4 (1970).

Springer, S. "Reaction-Time Measures of Ear Advantage in Dichotic Listening." Paper given at the Acoustic Society of America Meeting, Boston, April, 1973.

Studdert-Kennedy, M., and D. Shankweiler. "Hemispheric Specialization of Speech Perception," J. Acoust. Soc. Amer., Vol. 48 (1970).

Thompson, C., and others. "Interaural Intensity Differences in Dichotic Speech Perception." Paper given at the Acoustic Society of America Meeting, Buffalo, April, 1972.

Van Lancker, D., and V. Fromkin. "Tone and Pitch Perception." Paper given at the Acoustic Society of America Meeting, Miami Beach, December, 1972.

Whitfield, I. "Centrifugal Control Mechanisms of the Auditory Pathway" in Hearing Mechanisms in Vertebrates. Edited by A.V. DeReuck and J. Knight. Boston: Little, Brown & Co., 1968.

CURRICULUM IDEAS AND CARE OF THE HEARING AID

Presented by Marlene Zuehlisdorff
Lecturer, San Francisco State University

This course included curriculum ideas -- how a person could make simple and inexpensive materials to help stimulate and develop language skills through activities, in addition to the care of the hearing aid.

I. Curriculum

A variety of recipes were included for making play dough and clay. The various recipes help the child become aware of the senses of touch and smell. The differences also help strengthen muscles and coordination in the child.

Recipes for Play Dough and Clay

(1) Oatmeal Dough

2 cups oatmeal
1/2 cup water

Food coloring (opt.)

Mix ingredients. This recipe is good for texture and will harden when shaped.

(2) Cooked Play Dough

1 cup flour
1/2 cup cornstarch

4 cups water
Food coloring (opt.)

Blend flour and cornstarch with water and mix. Add 1 cup salt and boil. To the boiling salted water, add 3-4 lbs. flour. This recipe does not harden very well, but will keep 2-3 weeks. Wrap with a damp towel and put in a container.

(3) Cloud Dough

6 cups flour
1 cup salad oil

Food coloring (opt.)
Enough water to make gooey

Mix all ingredients. Elastic consistency. Will keep 2-3 days in container.

(4) Soap and Sawdust

1 cup whipping soap (Lux flakes with water and whipped)
1 cup sawdust

Mix all ingredients. Grainy texture, brittle. Will keep 2-3 days.

(5) Mud Dough

2 cups mud
2 cups sand

1/2 cup salt

Mix all ingredients. Will keep only a day.

(6) Soap Modeling (Clay)

2 cups soap flakes
Water to moisten

Food coloring (opt.)

Whip ingredients with egg beater. Hardens to mold-like wax. Needs a week to dry completely.

(7) Coffee Grounds Dough

2 cups used coffee grounds
1 1/2 cup cornmeal
1/2 cup salt

Water to moisten
Food coloring (opt.)

Mix all ingredients. Grainy texture and excellent smell.

(8) Salt Clay

1 cup salt
2 cups flour
1/2 cup water (add more if dry)

2 1/2 T. oil
Food coloring (opt.)

Mix all ingredients. To keep fresh: put in Tupperware and refrigerate. Do not bake. Preskill to cooking, baking.

(9) Smell Jars

Get several small jars (baby food jars are perfect) and into each jar put a variety of smells (e.g., garlic oil, mint, cinnamon, etc.)

Arts and Crafts

(1) Paste: Papier-maché

1 cup sawdust
1/2 cup wheat paste
Water to make it pliable
Mix all ingredients

(2) Finger Paint

Laundry starch
Tempera paint

Mix ingredients and pour into a squeeze container for easier handling.

(3) Salt Paint

1/2 cup liquid starch	2 cups salt
1/2 cup water	Food coloring (opt.)

Mix all ingredients. Excellent texture.

(4) Leather Vase

1 bottle (any size)	Masking tape
Shoe polish	

Tear masking tape in jagged edges and cover bottle completely, overlapping. Take shoe polish paste (brown) and cover masking tape. Looks like leather. Spray with clear lacquer, so it doesn't smear.

(5) Fish Paper Plates

2 paper plates for each fish. Paint both plates. Then, cut out construction paper fins. Staple the two plates together with the fins partially inside. Draw on eyes and designs.

(6) Mobile Balloon

Blow up a balloon and knot. Paint paste on the balloon and wrap yarn or string around it. Spray shellac over it and pop the balloon when dry. Yarn or string will keep its shape.

Several curriculum ideas were also given by the students.

(1) Stained glass wastepaper basket

Take one empty ice cream gallon and spread the outside with liquid laundry starch. Overlap different colored paper Kleenex over the starch. Spray with shellac when dry.

(2) Noodle Bath

Boil noodles (spaghetti) and put it into a wading pool with a little water. Add food coloring.

(3) Saw Horse

Have the children sandpaper the horse. Then, get water color paint and have the children paint the saw horse. Then, attach bolts of different sizes, so that the children can attach different sized screws, washers, etc.

(4) Bottle Finger Puppets

Get a small medicine bottle, paint a face on it, and paste on yarn for hair. Cut a circle out of a construction paper and a hole in the middle for a dress.

(5) Crepe Paper Ball

Shape chicken wire into desired shape and stick crepe paper through the wire, filling the whole construction.

II. Caring for a Child's Hearing Aid

As I visit classrooms and speak with the teachers, administrators, and paraprofessionals, it seems that many are very uncomfortable with their knowledge of the children's hearing aids and their care. The aids should be inspected and listened to each day when the child arrives at school. To help you become more familiar with individual amplification, I have brought some hearing aids today and will demonstrate how to check them. First, however, I will ask each of you to find out the brand name and model of each child's hearing aid on the first day of school so that you may get the specification sheets from a local hearing aid dealer. This is very important for these "spec" sheets tell you the type of battery which will give optimal performance as well as the size of tubing, and the

proper cord and receiver that should be used with the child's particular hearing aid.

Batteries

Hearing aids are of two general types. The ear-level instruments (behind the ear, in-the-ear, and eyeglass) or conventional aids (body worn). Each aid is designed to use a particular type battery which, as I mentioned earlier, you can find on the "spec" sheet.

A battery tester can be purchased very inexpensively, and it will enable you to quickly check a battery. Remember, the battery is the power source for the aid so it is a vital component. I suggest you keep extra batteries for each child so that if he comes to school with a dead battery he will not spend the day without sound.

When a battery is inserted, the positive (+) and negative (-) surfaces must be correctly placed or the hearing aid will not work. Both the batteries and the battery compartment of the aid are marked so this should eliminate problems. Whenever the hearing aid is not being used, remove the batteries for they may collect excessive moisture and corrode. Extra batteries should be stored in a cool, dry place.

If the battery terminals should corrode, a scratchy sound will occur when you listen to the aid. This can usually be corrected by cleaning the battery terminal with a pencil eraser. If the contacts in the battery compartment have worn, they should be replaced by the hearing aid dealer.

Switches and Controls

Most body and ear-level aids have an on-off switch as part of the volume control. Dust may gather here and cause a scratchy sound in the aid. Should you notice this, you may clean it with a soft brush such as a child's toothbrush. If this fails to eliminate the scratchy sound, you will need to take the hearing aid to the dealer for repairs. Many aids have a switch marked "T" and one marked "M." The "T" represents telephone and the "M" microphone. In general, the switch should be in the "M" position in order for the aid to function. The "T" position is only to be used if the child is on the telephone or if your classroom has a special amplification system which requires the child's hearing aid to be in the "T" position in order to hear what is being said. Again be reminded, if the child has switched his aid to the "T" position, he has turned off and will receive no input from his environment.

Cords and Plastic Tubing

Conventional hearing aid cords are made of numerous delicate wires encased in a plastic insulating material. Knots or kinks in the cord may cause it to break as will chewing on it. To check for cord defects, gently roll the cord between your fingers while you listen to the hearing aid. If the aid seems to go on and off intermittently, replace the cord. Another trouble area may be the contact points between the cord and receiver and between the cord and the hearing aid. They too can become worn or broken. When this occurs, you will need to replace the cord.

Plastic tubing is used in ear-level aids to connect the sound nozzle of the hearing aid and the earmold. Again, the manufacturer's "specs" will give the exact size tubing which should be used. Bending, chewing or kinking of this plastic tubing can result in cracking; or a small hole will appear. This opening will result in whistling or feedback. Feedback also occurs if the plastic tubing becomes stretched, thereby providing an inadequate seal for the earmold. In these instances the tubing will need to be replaced.

Earphone

The earphone or receiver attaches to the earmold and acts as the speaker for the hearing aid. Since it is delicate, dropping it or banging it against a hard object will cause it to malfunction. The use of an inexpensive "receiver saver," which secures the earphone to the cord, is recommended; it will protect the receiver from falling off the cord should the earphone be accidentally pulled from the ear.

The earphone for ear-level hearing aids is not observable; it is contained within the body of the aid.

Earmold

One of the most frequent causes of feedback is an earmold which fits improperly. It is very important that an individual earmold be made for each ear to ensure a proper seal. As the child grows, the ear canal will change size and shape, so new earmolds need to be made periodically.

To clean the mold, use mild soap and water or a cleaning solution which can be purchased from a hearing aid dealer. Never use alcohol for this may cause the mold to disintegrate. Before cleaning a conventional hearing aid mold, unsnap the earmold from the earphone. To clean an ear-level aid, you will need to remove the tubing from the sound nozzle. After cleaning the mold,

insert a pipe cleaner in the canal part to remove any excess moisture.

A Listening Check for a Conventional Hearing Aid

1. Insert a new battery, making sure the positive and negative surfaces are correctly placed in the battery compartment. If battery terminals or contacts are corroded, clean them.
2. Set controls:
 - a. On/off switch in off position
 - b. Volume at lowest setting
 - c. Switch in "M" position
3. Place the earphone to your ear, covering it with the palm of your hand. To prevent feedback, hold the body of the aid away from your ear.
4. Turn the aid on. Slowly turn the volume wheel up, listening for distortion or "dead spots."
5. Turn the on/off switch back and forth to check for intermittent sound or loose contacts.
6. Roll the cord gently between your fingers to check for "cutouts."
7. Check the cord connections for firmness.
8. To check for loose connections or power reduction, gently tap the aid on all sides.
9. Turn the aid off and remove the earphone from your ear. While holding your thumb over the opening of the earphone, turn the hearing aid on and turn the volume up all the way. If a whistling sound comes from the hearing aid case or the earphone, the aid needs to be serviced.
10. Replace the mold, and repeat procedure. If whistling occurs, return the aid to dealer for service.

A Listening Check for an Ear-Level Hearing Aid

1. Complete Step 1 for conventional hearing aids.
2. Complete Step 2 for conventional hearing aids.
3. Check the plastic tubing for stiffness, pinholes, or cracks.

4. Remove the plastic tubing and earmold from the nozzle of the aid and place your thumb over the opening. Slowly turn the volume up. If feedback results, the aid should be taken to the dealer for service.
5. Remove the earmold from the tubing and clean it.
6. Attach the tubing and earmold to the nozzle of the hearing aid. Place your thumb over the opening on the canal portion of the mold. Turn the volume to maximum. Again, if you hear feedback, the aid should be returned to the dealer for service.

PARENT EFFECTIVENESS

Presented by Susan A. Mouchka
Psychometrist, Sonoma State Hospital

The participants were asked to list characteristics which they felt typified parents of deaf-blind children:

1. unhappy
2. over compensation
3. warm
4. uninformed
5. interested
6. frustrated
7. guilt ridden
8. involved
9. detached
10. lack of objectivity
11. warped
12. afraid of bad news
13. surprised
14. rejecting
15. overprotective
16. unappreciative
17. uninvolved

The participants were then asked to list what they thought their reaction would be if they were parents of a handicapped child:

1. overprotective
2. overwhelmed
3. apprehensive
4. wise
5. ignorant
6. ashamed
7. guilty
8. confused
9. advocate
10. embarrassed
11. bitter
12. angry (Mouchka)
13. withdrawn
14. resentful
15. cheated (Mouchka)

Positive parental attitudes are vital for working effectively with deaf-blind children. It is difficult for anyone who is not a parent of a handicapped child to identify with their feelings. Too often these parents are referred to as "they," a unique group of people. We need to realize that "they" are parents just like any other parents and should be treated as such. Frequently a parent's feelings and attitudes are questioned by a teacher; this makes it difficult for the parents to seek the teacher's help and understanding. An important point brought up by one of the students was the use of "professionalese" -- the overuse of terms by professionals not necessarily understood by parents. Frequently, this is accompanied by a subtle "put down" of the parents by the professionals. The parents often sense this attitude and resent it; this interferes with the professional/parent relationships.

Another factor that may cause dissension between parents and professionals is that professionals often do not allow parents to share in the development of the curriculum for their children. Too often the attitude "we know better" is communicated right away with no facilitation of the families' own clarification of goals. Only when the facilitation process has been worked through can the family make use of what the professional has to offer; only then can the professional resource be used. The message "we know better" frequently motivates defenses which prevent the family from coming to its own conclusion that the professional can be of use.

The goals of one anonymous mother were shared with the participants:

1. "I wish, foremost, for my child to be happy. If he can be that living at home (and I am still able to care for him at home), fine. If he wants to live away from home, then I must provide a place for him to live -- not just exist.
2. I wish my child to be educated to the extent of his abilities and capabilities by using his education. I would not like to see him be a doctor who would never get a patient, say.
3. I would like him to have enough daily living skills so that he will not feel he is a great burden. I would like him to be able to wash himself (at least the parts a grown man would not like his mother to wash), toilet himself -- I will not be able to take a grown man into the bathroom marked ladies. Brush his own teeth and assist (at least) with his dressing. (A grown man would not like his mother to put his underwear on him.)

Also, shave himself and put on his own deodorant.

4. I would like to see my son continue to be happy with himself, so that others will continue to be happy about being around him. He should also learn to be gracious about asking others to help, so that they will want to, and he should be proud enough to ask for help only when he genuinely needs it.
5. I would like to see my son be content in using his leisure time wisely. If he feels he must work outside, then I would like to see him do something of service to his community.
6. I would like companionship for my son, both with normal men and women and with other handicapped people. I would like a place for him where he can go and meet new friends and see old ones, to talk, listen to music, bitch when necessary, and whatever else young people will be doing then (short of doping themselves).
7. I would like my son to have an appreciation of beauty. To be able to choose that which is good over that which is valueless. To be able to see the good in everyone around him, and not be afraid to voice what he feels.
8. I would like my son to pick up after himself, to put his clothes where they belong. I would also like to see him be able to do simple chores around the house.
9. I would like him to be able to maneuver himself at least enough so that I will not be afraid to leave him alone for short times. He should be able to get himself out of the house in case of an emergency such as a fire if I am gone. I would also wish him to be able to recognize an emergency and be able to think what to do about it, and how to do it.
10. I would like him to be able, when he goes to a doctor, to tell the doctor what is wrong -- where it hurts, and what the symptoms are to make him want to see the doctor."

And, finally, the real challenge to the curriculum developers:

11. "I wish to God I knew how to help him accomplish these things."

A child with a handicap affects each of us in different ways -- all sorts of feelings surface, whether we understand them or not. There is a tendency of imposing our own ethics on the families that we propose to serve. Parents generally feel comfortable with aides, and do not feel as threatened by them as they do by the professionals.

Too often parents are described in labels. The behavior that typifies the labels is often described with scorn, contempt, and as a nuisance, rather than as a symptom of human pain. For example, if parents are over-protective, what is behind that behavior? Could it be that a parent acts overly protective to alleviate an unconscious painful sense of guilt? Could it be the child signifies failure to the parent and a helplessness that they are incapable of working with the child? Could it be that the overprotective behavior is a defense against the parent's legitimate but intolerable rage? Could it be that a parent is "nonaccepting," "rejecting," "denying," out of a sense of deep sadness and mourning? How overwhelmed are the parents by these feelings? And what about rage? -- rage that is connected with the fate of lifelong caretaking; the offense against oneself and one's child; the financial burden; the daily hour by hour rage, when every single step of a daily routine is increased in difficulty; and the daily life harassment. How intolerable is this rage to the parent himself because of its apparent incompatibility with the need for intensive care of his child? And where does the parent direct his anger? It could be directed toward the educational system, the medical personnel, the home visitor, or the teacher. How does the professional handle the anger? How comfortable is the professional himself with getting in touch with those feelings, uncovering them, and providing an atmosphere in which they can be expressed? How, why, and to what degree is the expression of certain feelings threatening to the intervening professional, and how much of his or her energy is spent blocking the expression of those feelings?

There is, in most cases, a need to get in touch with what parents are feeling. Empathy is the vital component in working effectively with parents -- it lays the groundwork and conditions for change. Help is based on understanding. To illustrate this point, an incident was described in which a teacher-in-training asked his master teacher, "What do we do with the parent who gets upset or feels negative about all the conflicting information he has gotten from the various professionals?" The question itself reveals discomfort with the expressions of certain kinds of feelings, and the need to find a way to control them. The phrase "what do we do with the parent" connotes opposition rather than alignment. It is another way of saying, "What can I do to make myself more comfortable?" or "How do I control

the expression of those feelings?" -- "I need to control them because of the anxiety which they stir in me." The master teacher's response was, "The parent should be given some cold hard facts. He should be told the reality, that there is no one answer." This response is intended to, once and for all, settle the feelings of the parent, and further, to defend the professional stance. What often prevents the professional from making an empathic response is the mistaken notion that an admission of imperfection on the part of the professional, and a justification of the parent's anger, would result in the loss of authority and would decrease his or her effectiveness in the helping role. As an alternative, the intervening professional might first have aligned himself with the parent by saying, "That must be very confusing," or, "That's very frustrating, isn't it?", or "I think I might feel very angry about that if I were you." Parents will be more likely to listen if they have been listened to.

A question was raised by one of the participants: "Why did a mother take in a deaf-blind foster child when she had a deaf-blind child of her own, and, therefore, is neglecting her foster child?" Typical answers given by the students were: "Probably the mother had a sense of failure and feels she is not doing enough," "To ward off guilt, the extra child serves as a defensive process," and "The mother, seeing the second child, feels that her own child is not as badly off as she had thought." To provide more insight and to clarify the problem, role playing was initiated. Two students were given the role of parent and teacher. Alter egos for each role were also assigned to voice opinions. This demonstration illustrated how easy it is to fall into the trap of imposing our own ethics and morals upon the families we serve, and how quickly a defense can be put up, resulting in a breakdown in communication. You can't tell someone to love another child, but you can make it easier to understand that it is perfectly okay to love some more than others. Individuals working with these children must be involved, for without a deep, personal commitment, little progress can be made.

DEVELOPMENT OF PRELANGUAGE SKILLS OF DEAF-BLIND CHILDREN

Presented by Marlene Zuehlisdorff
Lecturer, San Francisco State University

Part of my job at San Francisco State University involves the supervision of graduate students in the deaf-blind area during their practicums and student teaching experiences. This takes me to many San Francisco area classrooms where deaf-blind children are being served. A frequent question from graduate students and sometimes from master teachers is "How do I begin teaching language to the nonverbal child?" I will be giving three lectures during this summer institute; they will focus on this very question. In my presentations I will concentrate on the work of John Southwell, Jon Eisenson, and David Premack, for I believe their extensive work in language development has particular import for the children with whom we work.

I. Teaching Nonverbal Deaf-Blind Children

John Southwell works with nonverbal deaf-blind children in a residential setting in England. He describes the nonverbal child as one who is without any form of symbolic communication. This child does not point, gesture, or communicate through pictures, and he or she lacks any form of vocalization.

You have probably all had children like this in your classroom. In addition, they show little response to affection or human contact. If placed in your lap, they show little interest in you but rather continue with some ritualistic behavior such as finger flicking, eye poking, or light gazing. When presented with objects or toys, the child again uses them only in stereotypical ways; he may only bang them against a part of his body.

Southwell maintains that, for children such as these just described, the foundation of any prelanguage program must be the development of social awareness. If a child rejects being handled by an adult, this is where you as a teacher must begin in developing his social awareness. You might start by getting him accustomed to being rolled and pushed about in a gentle manner. Hold the child in your lap tightly, and don't let him down the moment he squirms or thrusts his arms back. Give the child a feeling of security. You may wish to hold the child on your lap, holding both of his hands, and initiate some rocking, swaying, or even bouncing movements. Watch his face for any type of positive expression, and reinforce this through your own facial expression and vocalizations. When the child becomes acquainted with these activities, Southwell

suggests a signaling system is begun. For example, the child may be on your lap; you clap your hands and begin to bounce the child. Stop. Wait for the child to give some indication to begin the bouncing once more. If the child makes no attempt at the signal, and you have previously established that he enjoys this activity, manipulate him through the clap of the hands and then begin the bouncing. It should be remembered that any approximation or attempt at the signal should be accepted at first. Your goal is to teach the child that he can make something happen; that through communication there is power to control situations and direct others.

When a child has learned one signal, teach another and then determine if he can discriminate between the two. Signals can be devised for food and drink as well as for those associated with daily classroom routines.

The nonverbal child must be taught how to play with toys and the use of objects -- how to hold, join, combine or build with them. Progress from large objects that involve gross motor coordination to smaller ones involving fine motor control. When progressing to discrimination-type activities, Southwell cautions the teacher to vary only one dimension at a time. This means if color is varied, then size, shape, and texture should remain constant during the initial training in discrimination. The teacher must also be reminded that, when using materials such as clay, paint, or play dough, the child must be shown a variety of ways in which the material can be handled. It isn't enough to just put the material in front of the child and expect him to be creative. If you are using clay give him a cookie cutter or a rolling pin, and show him how to use the equipment, thereby enabling him to make some form out of the mass in front of him. You are constantly trying to expand the child's repertoire instead of encouraging him to continue in his use of a limited number of repetitious activities.

II. Teaching Nonverbal Aphasic Children

Jon Eisenson has devised a program for nonverbal aphasic children; this program has applications in teaching prelanguage skills to deaf-blind children who have some residual vision. As with the Southwell methods, this is not presented as a total language program but as a component that you may wish to incorporate in your language program.

Level I - Object-to-Object Association

1. Matching of Identical Objects

At this beginning level oral communication is deemphasized. The child is shown a procedure and then directed to carry out the activity through pointing or gestures. If the child is unable to accomplish this, he is manipulated through the procedure until he can perform it unassisted.

The child is presented with identical objects, life sized and within his environment. Although the child may have no names for these objects, he certainly knows about the many things with which he comes in contact with daily. It is with these familiar objects that we begin. For example, you might start with a pair of the child's shoes. In a teaching situation you and the child are seated at a table upon which you have placed one of the shoes. This first shoe should be placed within the child's visual range near the center of your working area. For convenience we will name this first shoe the target object. Now place the identical mate to this shoe on the table nearer to the child than the target object described above. This will be referred to as the choice object. Begin by directing the child to watch as you pick up the choice object and place it next to the target item. After the child has observed you in this simple procedure, replace the choice object to its original position. Now see if the child will imitate your action; if not, manipulate him through this until he is able to place the choice object next to the target object. At this stage Eisenson suggests rewarding each action with something appropriate to that child.

Following this initial stage continue to another pair of objects that you know are within the experiential environment of the child. Again make sure the objects are identical in every way. When the child successfully masters several objects, test him. This can be done by introducing in the same manner objects that were not used in the previous training. When the child demonstrates that he has mastered this, add an incorrect object to his correct choice object. For example, if the target object is a shoe, give him a shoe and a ball to choose from in matching the identical objects. It is very important that the child is taught to look at the target object and then each of the choice objects before making a decision. Try very carefully to avoid indicating a correct choice through your facial expression until the child has completed the task.

2. Matching of Like but not Identical Objects

This begins the process of categorization. The target item may be a spoon; and the choice item is also a spoon, but of a smaller size. All other dimensions should remain constant with the exception of one which in this instance is the size. The procedure is the same as is outlined above, adding one incorrect choice item in the later stages. As in all stages of this program, it is very important to test periodically, using objects not previously introduced

to see if the child is making the generalization.

Level II - Categorical Matching

Two definitions are given here:

Perception: process of categorizing or organizing of objects or events into categories

Categories: events or objects which share common features

At this level the teacher may, for example, use a spoon and a fork as the target items and use a spoon and a shoe as the choice items. This aims to begin the concept of categories. (In this example the category is silverware.) As you will note, Eisenson's goal is to develop inner language at this time, not to teach vocabulary or the written symbol for each of the objects being utilized.

Level III - Matching by Associated Function

This is a very small step from the above level. Here one might use a cup as the target item and a spoon and a pencil as the choice items. The child is to choose two objects that are used together. You are still using real items familiar to the child. It is not important if the child knows the name of the object for you are not teaching speech or vocabulary but more generalized concepts. A next step in this progression may include the function of the object. Give the child a cup and show that it is for drinking. The sock is for his foot, and so on with the items you have used in the training. Can the child show you the function of each item by himself? Can he demonstrate other uses of the items? These two questions can serve to expand this level of training.

From the real objects Eisenson suggests you then use visual representations (pictures) of the real objects. As can be seen we're moving from the concrete to a medium that is somewhat more abstract. If possible, use life-size colored pictures of the objects that were previously employed. Use these pictures in the same manner as the real objects were used, periodically checking to be sure the child is making the intended generalization. It is very important to keep careful notes of your observations of each child's progress so you will be able to better plan each lesson. It is very easy to forget exactly what the child can do and why he made mistakes with certain tasks.

From the colored pictures one might use the same procedures previously discussed but now use black and white pictures or line drawings. Again

it can be seen that we are moving from the concrete level into more abstraction.

Geometric forms may also be used. Start with a form board having only one inset. When a child learns to put one shape -- let's say the circle -- into the form board well, continue to a form board with a different shape. When all the shapes have been learned, give two shapes. Soon the child should be expected to be able to point to the shape that will fit into the well without using a trial and error procedure. A next step may be to teach him to recognize which of two shapes will not fit in the well. This negation is important to learn because it is used frequently in our language. To expand this activity, a child could be given two circles of different sizes and indicate the one that will or will not fit in the well.

Sequencing activities may be another step in a prelanguage program. Begin by placing a group of the objects used in the training in a sequence. Now have the child duplicate the sequence, choosing the necessary objects needed for the task. When he is capable of handling this task, construct a sequence for him, direct him to look at it, remove it from his sight, and ask him to reconstruct the sequence from memory.

Following this the child could be taught to continue a pattern which has been started. Perhaps begin with two shapes. You put out a circle, a square, a circle, a square, and let him continue the pattern. When he can do this, make the task more difficult using three shapes or objects, then four. This skill is a prerequisite to spelling and reading. Similar activities could be devised using letters of the alphabet or numbers. When a child is capable of looking at a pattern and continuing it, show him a pattern; then remove it from his sight and direct him to reconstruct what was seen. This is a very important skill because spelling, reading, speechreading, or remembering a finger-spelled or signed message all involve visual memory.

For more information on the training program developed by Dr. Eisenson, I refer you to his book entitled Aphasia in Children (Harper and Row, Publishers, 1972).

III. Training Chimpanzees

David Premack is presently at the Behavioral Sciences Institute at the University of California at Santa Barbara. Through his studies with chimpanzees in the behavioral sciences, Premack surmised that the chimps were at a level able to learn language.

Premack began his work with Sara, a six-year-old African-born female chimpanzee. He did not use a phonetic language where the basic unit is the phoneme but instead used the word as the basic unit for the language he devised. Premack used pieces of free-form shapes made of plastic to represent words. The shape did not relate to the actual meaning of the word, nor did the color correspond with the color of the actual object.

The plastic pieces were magnetized and placed on a board in a vertical manner. The work took place when both the trainer and chimp were seated at a table. If you were to use Premack's strategies and adapt their use for deaf-blind children, I would suggest you use real objects, pictures, or the written word rather than plastic pieces representing such. I would also present the language patterns in a horizontal not a vertical fashion, because that is the way English is written.

The language work took place at feeding time. The first step was to place a piece of food within sight, but out of the chimp's reach. The piece of plastic representing that food was placed near Sara, and she was to move the plastic next to the food in order to be allowed to eat it. Much facial expression was used, and approval was strongly indicated by a nod and a smile.

Soon, Sara was expected to choose the correct symbol representing the real piece of fruit from three pieces of plastic meaning apple, banana, and orange, for example. Sara would have to choose apple, and put it next to the piece of apple in order to get it.

Next, she was moved to the two-word level. No longer were one-word level responses accepted. She had to produce Mary apple in order to be given a piece of the apple by Mary, the trainer.

To establish the concept of same and different, the chimp was presented with three objects; for example, two cups and a banana. Sara was required to put the two like items (cups) together to learn the concept of same.

Next, the two cups were presented with the plastic piece representing the word same below them. The word same was to be placed between the two cups by Sara. The phrase then became cup same cup. To test this, an item not used in the training was presented with the word same. If Sara could generalize to the new situation, the trainer knew she had attained the concept of same. When this was established, then a cup and a banana, for example, were presented with the word for different below them. Sara was to place the word for different between the cup and the banana to create the phrase cup different banana. To test Sara's ability to use the same-different concept, she was given the cup and the banana with both the words same and different, thereby making

it necessary for her to choose the correct word in order to complete the phrase correctly.

The question was the next concept to be taught. To do this the trainer presented cup ? banana. The chimp was to remove the question mark and replace it with the plastic symbol representing same or different. From here the instruction moved to ? same apple (real object) with the plastic representation of apple under it. The chimp removed the ? and replaced it with the word representing apple. Premack and his trainers began with only one choice and worked up to two or three during the training procedure.

The next step involved yes-no questions, which proved to be a very difficult concept to establish. To start, the trainers presented the phrase Mary give apple. Then Mary would give Sara a piece of apple. Following this the phrase Mary no give apple; and Mary would remove the apple from sight. A later stage involved ? X X same meaning are X and X the same? Initially, the word yes was to be substituted for the question mark, then the word no, and finally the chimp was to choose between the two answers yes and no.

At this point, Premack and his associates sought to increase Sara's vocabulary. The trainer would bring in an object that was known to Sara. For instance, she was presented with apple apple (real object) followed by apple apple. Sara simply had to insert the name of in the blank. The next task was apple banana which involved the insertion of not name of to complete the phrase. Then the two choices name of and not name of were offered, and Sara had to choose the correct answer to complete the phrase.

The trainers also taught Sara the concepts of color, shape, and size. All of these were taught in the same manner as name of and not name of. To illustrate, red apple (object), and red banana (object). color of not color of

Throughout, each step was only offered four times before a test was administered. If Sara had grasped the concept after the four trials, the trainer moved on.

After learning size, color, and shape, Sara was presented with the phrase Mary give Sara green and the trainer, Mary, would give it to her. After this was mastered, the phrase changed to Sara give Mary green. Initially,

only green was available, and Sara merely had to hand it to Mary. Later, she was expected to choose from two colors and then complete the task called for in the phrase.

As you will note in the description of the training program, Sara did not develop any phrases without first being taught them specifically; in other words, she did not use language spontaneously.

BIBLIOGRAPHY

Behavior of Nonhuman Primates (Vol. 4). Edited by Allan M. Schrier and Fred Stollnitz. New York: Academic Press, Inc., 1971.

Cognitive Processes of Nonhuman Primates. Edited by L.E. Jarrard. New York: Academic Press, Inc., 1971.

Genesis of Language: A Psycholinguistic Approach. Edited by Frank Smith and George Miller. Cambridge, Mass.: M.I.T. Press, 1968, pp. 295--335.

Premack, David. "Language in Chimpanzees," Science, Vol. 172 (May 21, 1971), 808--22.

Premack, David. "Teaching Language to an Ape," Scientific American, Vol. 227, No. 4 (October, 1972), 92--99.

LANGUAGE, NATURE, AND EARLY ACQUISITION

Presented by Jon Eisonson
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"Srimpgbnu," "ngptdluoypre," "dzignag." Can these words possibly be language? Can they possibly be English? These words cannot be English, since they do not have enough vowels, and they begin with letter combinations not used in our language. Although they cannot be English, there are languages which use such combinations in words.

A child can learn any language to which he is exposed. The earlier the exposure, the more easily a proficiency is obtained, so that by age 12, a new language is already difficult to learn.

A child should learn a second language as early as possible. Most children have no trouble learning two languages simultaneously, as long as there is consistent stimulation; that is, one person should speak one language consistently or use one sign language consistently.

Human languages have a large margin for error. Many of our sentences have many meanings. "The baby was found by the old man" could mean that the old man found the baby or that the baby was found next to the old man. Much of our language is ambiguous. Humans strive for variety more than for accuracy of meaning. If a word is used very often, we consider it repetitious even if the meaning is exactly correct.

A language has three structures, the first of which is phonology. Phonology consists of the sounds and the rules for combining them -- phonemes and their grammar. An example of this is that we never use the *sr* to begin a word.

The second structure of language is morphology. This consists of the morphemes and their grammar. A morpheme is the minimum unit of meaning.

Third is the syntax. These are the rules that govern the way words are put together in an utterance. All of this complicated grammar is mastered by a child of three years. No language is difficult for a child. Language problems are conquered in any language at about the same age. Plurals and past tense, for example, are learned at the same time by children learning any language.

Up to the age of 15 months, infants employ four to five sounds in their

intentional word usage including: (1) nasal n or m; (2) stop t, k, p, d, g, b; (3) one or two vowels a, æ; or (4) the sibilant sh. At this age the sounds are the same in all languages. The nasal m or n is used for the English equivalent of mama all over the world with few exceptions. The first 25 words will all have the above four components.

One approach to the phonemes of speech is through the use of distinctive characteristics or features. Some of these sound characteristics are vocalization, nasality, stop, and tongue-position. It is best to pay attention to these and begin to teach children who have difficulty in normal speech acquisition with sounds which are apart in two or more features.

When speakers of two cultures with separate languages need to communicate, a system of communication springs up which is called pidgin. At first there are few rules. Each person uses what he can to communicate. As more pidgin is spoken, rules begin to form, order is established, and features are added. This process is creolization. The pidgin becomes a creole language. As the process continues in the creole language, it becomes a dialect of another natural language.

The process of language acquisition begins at birth. First is the prelingual stage, beginning with the birth cry and extending through the first 3-4 weeks, which is strictly reflexive and undifferentiated. No matter what the stimuli, the cry sounds the same. Normal children have a characteristic 3-stage cycle to their crying. There is an onset, a cruising, and a phasing out. This is repeated over and over. Autistic children seldom ever cry, and when they do, it is a slight whimper not repeated. Some brain-damaged children have a way of vibrating their vocal cords separately to make a two-pitch pattern. Deaf children sound the same as normal children in the early crying.

By 4 weeks, the normal child's crying becomes differentiated -- he cries differently when he is hungry, when he is cold, etc.

At 4 - 6 weeks, babbling begins. The baby has begun to spend some time awake and not crying. At this stage all sounds are made. Sounds from other languages are made, some animal sounds are made, and much experimentation takes place in sound play.

When the child reaches 4 or 5 months, he begins la-la-ing. This is self sound imitation. He says a sound, then repeats it over and over. A deaf child begins la-la-ing, but it fades out very soon. This is the first stage in

which the deaf are easily recognized. This stage is very important for the child to learn control through repeated movement.

Around 6-7 months, the child becomes echolalic. The children are repeating what others say. They begin to learn that certain sounds go with certain objects. They are producing a conditioned response. Deaf children have no echolalia. Some autistic children have very efficient echolalia, but no meaning is associated with what they say. At this stage, normal kids are tuning into the sounds and rules of language.

At 9-15 months of age, identification language begins -- the child uses words to identify a happening he has learned.

Only after all the above stages have been mastered does true speech begin. This is the point at which the child says something and anticipates an outcome. At this point he no longer just identifies, but he says "cookie" and then looks for and expects the cookie to be given to him.

When 50 words have been learned, the child begins to put two words together. In doing this he begins to create new statements using vocabulary and rules already learned.

The largest growth in vocabulary is between 18-36 months. This growth continues until senility. At 7-8 years, a child's phonology is completely under control. At 11 years, the child's syntax is mastered, and the basic language acquisition processes are complete except for continued growth in vocabulary and comprehension of statements both in association with direct and vicarious experiences.

STRUCTURED NATURAL APPROACH TO LANGUAGE

Presented by Eileen Jackson
Professor, San Francisco State University

The development of language is unique to the human species. Language is developed so that needs can be satisfied. The development of language in a hearing child follows a natural scheme, and it is this approach, if structured, that can be modified and adapted to help the deaf child acquire proficiency in language skills.

The first step in developing language skills is helping the child to listen and use his residual hearing. The use of residual hearing is the most critical aspect in working with the young deaf child. The importance of using the child's own hearing aids cannot be overemphasized. A teacher would not substitute a child's eyeglasses, and so, the same considerations should be given to hearing aids. Instead of listening to bells and extraneous noises, concentrate on listening to language. Sentence length, rhythm, and intonation can be responded to by most deaf children and can lead toward increased ability to process language auditorially. The child with a severe hearing loss can receive much information from intonation. Rhythm has been associated with memory and may be the way we "chunk" information.

Around the age of nine months to a year, the child produces his first true word that has meaning to him and is positively reinforced. For example, the child quickly learns through his interaction with his parents that saying a word closely approximating "Mamma" will bring the mother to his attention -- the mother smiles, and so, the child is reinforced to continue this behavior. Usually, "Mamma" is learned first, because it is a word that naturally occurs, possibly because of the sucking response.

In his book Psycholinguistics, Roger Brown reports research indicating that in the early language stages imitation exceeds understanding and understanding is greater than production. As the child experiments with his language, he will attempt to imitate the language of his parents. This imitation carries the same meaning and word order as the adult model, but usually contains only the important words. This is called telegraphic speech. The parent fills in the gaps, repeating and expanding what the child is saying, such as "More juice" to "You want more juice." Although the child is experimenting with the language process, he still has not acquired the skills to generate his own sentences.

There are two types of sentence generation, one of which is called

holophrastic, where one word takes the place of a whole sentence. For example, if a child says "see" he may be telling you, "Look at what I have in my hands." Another is the open-pivot construction where the child, around 18-24 months of age, begins to combine words into meaningful units. For example, the child may add "more" to a variety of words to indicate his needs and desires -- "More Mommy," "More bye-bye," "More juice." He is playing with language and learning to put together words that have meaning to him.

If the child is limited in language skills, you must provide the child with enough motivation to want to use language and you must provide the child with consistent experiences upon which language can be repeated in meaningful units. Frequently, we make the mistaken assumption that teaching the names of objects is teaching language; however, labeling is not really language. There are no magic lists of words that should be taught to children; instead, use what is in the child's experience, what interests the child, and if need be, survival language. The playground and nonschool settings provide the best opportunities for teaching language. Be careful not to be too critical of articulation, because constant correction might result in the child refusing to talk; this defeats the goals of communication and language learning.

THE ABILITY TO COMMUNICATE

Presented by George Attietweed
Lecturer, Ohlone College

The ability to communicate with a deaf child is a very important skill for the adult who may also be a parent or a professional. It does not matter that there are different sign systems and that there are different opinions on the meanings or uses of certain signs as long as there are adults who recognize the need for meaningful communication between the deaf child and the people in his/her life. It is the adults who need the most help, the best guidance, and the intensive training so that they can develop into good language models. For these parents and professionals who take the trouble to learn a sign system it is suggested that they begin by learning a small sign vocabulary and simple sign grammar rules. As the adults continue to add to their original store of signs, they should be taught to recognize the three visible components that make up a sign. A slight change or a series of changes in one of these components can make a difference in the meaning or meanings of that particular sign. The components are as follows: (1) the distinctive configuration of the hand or hands; (2) the place of the body or the space where the sign is made; and (3) the movement or flow of movements or actions of the hand or hands. There is a fourth category that is worthy of note: the final action or the final handshape in the act of completing a sign. It is important to be aware of this component while learning the signs for such words as sleep, old, etc.

Not only must the sign student be aware of these three units while developing sign skills, he/she must also be aware of the human psyche in communication efforts between persons of different backgrounds and not be critical of the deaf person's sign language. As professionals, we recognize that there are differences in speech habits, voice quality, intonation, and the use of vocabulary by persons with normal hearing. We should also apply this awareness to the differences in the use of signs by both deaf and hearing persons. Upon closer study, one will see differences in the use of sign language by deaf persons. One could say: "Just as there are different dialects in speech, there are different movements in the making of a sign." The fact that does matter is the point that there is real communication between the deaf child and the people in his/her little world.

There seems to be a controversy over which sign system should be taught first -- American Sign Language (ASL or Ameslan) or one of the other sign systems such as Seeing Essential English (SEE¹) or Signing Exact English (SEE²). There are other systems, but the first two mentioned have a

wider circulation. It has been my personal teaching experience that hearing parents of deaf children do very well with the materials offered by the SEE² people. And when these parents handle signs very well as a mode of communication, it is recommended that they also add ASL or Ameslan to their store of signs, further enriching their ability to communicate with the deaf child. My reasons are as follows: both SEE systems employ many of the ASL signs; the SEE² book has pictures to represent signs, and parents like these pictures; and these signs allow the parents to keep their oral skills even if they are learning signs. We are walking a thin -- very thin -- line when we are dealing with persons who are frustrated daily in their efforts to develop speech skills in deaf children. These efforts, in turn, create frustrated deaf children who are turned off to any more effort in speech work, and this negative attitude may persist into adult life. There is literature that points out that deaf children of deaf parents seem to do better in many areas -- behavior, language, and even speech! The best answer is this: there was real communication between parent and child. That is the trick: Get the hearing adults to use signs. The use of SEE¹ or SEE² systems allows the hearing parent to use signs, allows him/her to remain oral, and there is much opportunity for input. The systems incorporate the English word order and word endings, and this approach permits the hearing adults to keep their English-ness within their minds. The philosophies presented by these systems are not everyone's taste, but if the signs are useful, use them! To continue the theme of use, the systems are helpful and innovative but they are not complete -- just as the English language is not complete. Surrounded by adults who learn and use fluently a sign/speech system which absorbs spoken idioms then in current use, in the word order and endings, the deaf child will have the chance to learn -- unconsciously -- the rules of standard English via the visual mode and also the auditory approach along with other innovative modes yet to be developed. The SEE systems attempt to provide language learning via the sign mode as much as possible for the deaf child as the sense of hearing does for the normal-hearing child during the early formative years.

To learn ASL, the sign student needs to forget English so that the fine nuances of ASL rules can be absorbed. This approach is much the same for the student of German or French. The college student has an academic goal in learning German, French, or sign. But what about the hearing parent of a deaf child? Perhaps the parent has been ill-advised that signs are to be avoided at all costs. There may be demands on the parent's time -- his job, his social life, or even his ability to absorb another language. And there is also the parent's ability to regard another language in a favorable light. The language of the people of America is English -- and this fact is evident in our public schools... even in our schools for the deaf. How many Americans enjoy another language besides English? Not many. What we are really doing is asking hearing parents of a deaf child to take up a foreign language.

Why not have the parents learn German so that the deaf child will speech-read German and carry this ability over to English, which may be the hardest language to lip-read? Along with the typical American attitude toward other languages, there is a problem in getting parents to learn a language different from English... the language with which they feel most comfortable. As for deaf adults, it is true that most of us employ ASL or combined systems that utilize mime, gestures, fingerspelling, or signs. The delivery of these signs may or may not follow the English word order and endings. It is the choice of the signer, who may depend on his knowledge of his audience, be it children or adults. If we talk about deaf children who attended a large school system and who developed a sign system within the confines of the school, it follows that these young children will have a sense for ASL in their adult life. In addition, there are hearing children of deaf parents, or hearing children who had deaf relatives, deaf neighbors, or deaf playmates -- and who, by exposure and association, have also developed a feel for ASL as a language. These children grow up to be hearing adults who are competent in the receptive and expressive aspects of ASL. If all hearing parents of deaf children were to enjoy the same exposure and opportunity to learn signs as they did, much of our work would be done. Alas, this knowledge does not exist for many parents who are confronted by a deaf child in their arms. And we do not wish to turn away prospective hearing adults who may learn that ASL is not to be signed/spoken simultaneously. It is meant to be signed period. It is meant to be signed in its own idea/sign order. Many times, in reading or rendering ASL, there are no words in the English language to go along with the sign or signs -- there is just a feeling or an inner idea of what was "said." This inner skill comes from long-term exposure to sign language and the people who use this language. All in all, encouraging first-time beginners to keep an open mind about the sign controversy and getting them to start their learning with a small sign vocabulary and simple grammar rules are perhaps the best first steps any sign teacher can do for his/her students.

HEARING EVALUATION IN A PROGRAM FOR HEARING-IMPAIRED INFANTS AND YOUNG CHILDREN

Presented by Janna Smith Lang
Audiologist, Coventry School, Campbell, California

I. Overview of Project

Project IDEA (Infant Deafness Educational Assistance) is a training program for hearing-impaired children from birth to three years of age. It is located in Santa Clara County, California. The project is an experimental nursery school providing a daily prenursery school for those children over 18 months of age, and individual tutoring and home visits for all children. The major emphasis of the project is early utilization of the child's residual hearing with appropriate hearing aids which are continually being monitored by the staff audiologist, teachers, and parents. Parents become actively involved through an education series, observations of individual lessons, participation in the nursery school, and conferences. School is held on Saturdays several times a year so working parents as well as other family members can attend.

Over the past three years, the children in the project have been evaluated on the Alpern-Boll Developmental Profile in November and April of each year. The Developmental Profile is used to assess physical, self-help, social, pre-academic and communication skills. Language development also has been measured on the Boone Scale, a scale developed by Daniel Boone, Ph.D., of the University of Kansas, for use in measuring language development of normal-hearing children. The scale has been modified for use with hearing-impaired children by the John Tracy Clinic and Project IDEA. Language encoding and decoding are evaluated by the scale. In addition, individual intelligence tests were administered by the Project psychologist. The tests were the Bayley Scale for children up to 18 months, the Merrill-Palmer Scale of Mental Tests for children between the ages of 19 and 29 months, and the Leiter International Performance Scale for children at 30 months and older. Hearing loss was assessed by the project audiologist in conjunction with the referring audiologist.

The validity of the Alpern-Boll Communication Scale was supported by strong, significant correlation with scores on the Modified Boone Scale of Language Development. An estimate of IQ derived from the Alpern-Boll Academic Scale correlated well with the results of individual intelligence testing, although the derived scores tended to be generally lower.

Data gathered on the Alpern-Boll on the children enrolled in the project in November, 1972, were compared with the data gathered on the children enrolled in the project in November, 1973. The data revealed general trends about the hearing-impaired youngsters as compared with the normal-hearing children on whom the Alpern-Boll was standardized. The hearing-impaired children met age norms in areas of physical and self-help with a slight weakness in social skills and deficits in pre-academic and communication skills (see Figures 1 and 2).

The Alpern-Boll enables the Project IDEA staff and parents to view the total child by assessing each child in the five developmental areas. Such a view is consistent with the project philosophy of dealing with the total child and not just dealing with the child's hearing loss.

II. Hearing Evaluation

Behavioral Audiometry

Behavioral testing procedures are used to assess the hearing of the children at Project IDEA.

In the period from birth to 12 months, the infant is held either by the mother or by a test assistant while the baby nurses or is given a bottle. The baby should be somewhat hungry and should not be too sleepy. Signals are presented in the sound field. The most clear-cut response which can be observed is the cessation of sucking in response to a signal that is presented. Although a child may start to drowse, he will rouse from a light sleep in response to sound. Expected response levels for various ages are determined by the Baby Auditory Behavior Index which was developed by Marion Downs (see Table 1). During the first year of life, there are some months when a child is more responsive to auditory signals than at other times. In the period from birth to 5 or 6 months, an infant is usually very responsive to auditory stimuli. There follows a period when responses to visual stimuli appear to be pronounced, and it is more difficult to observe behavioral responses to sound. The child again becomes more responsive to auditory stimuli in the period following the 7th or 8th month.

In the period from 12 months to 2 years, COR audiometry is used (COR is an acronym for conditioned operant response). Signals are presented either in the sound field or through earphones. A behavioral response to a sound is observed. The behavioral response is rewarded by a light. The child is then conditioned to look to a lighted animal when a sound is presented. Once the behavior is established, the child will turn to look for the light when the signal is presented. The behavior is reinforced by the

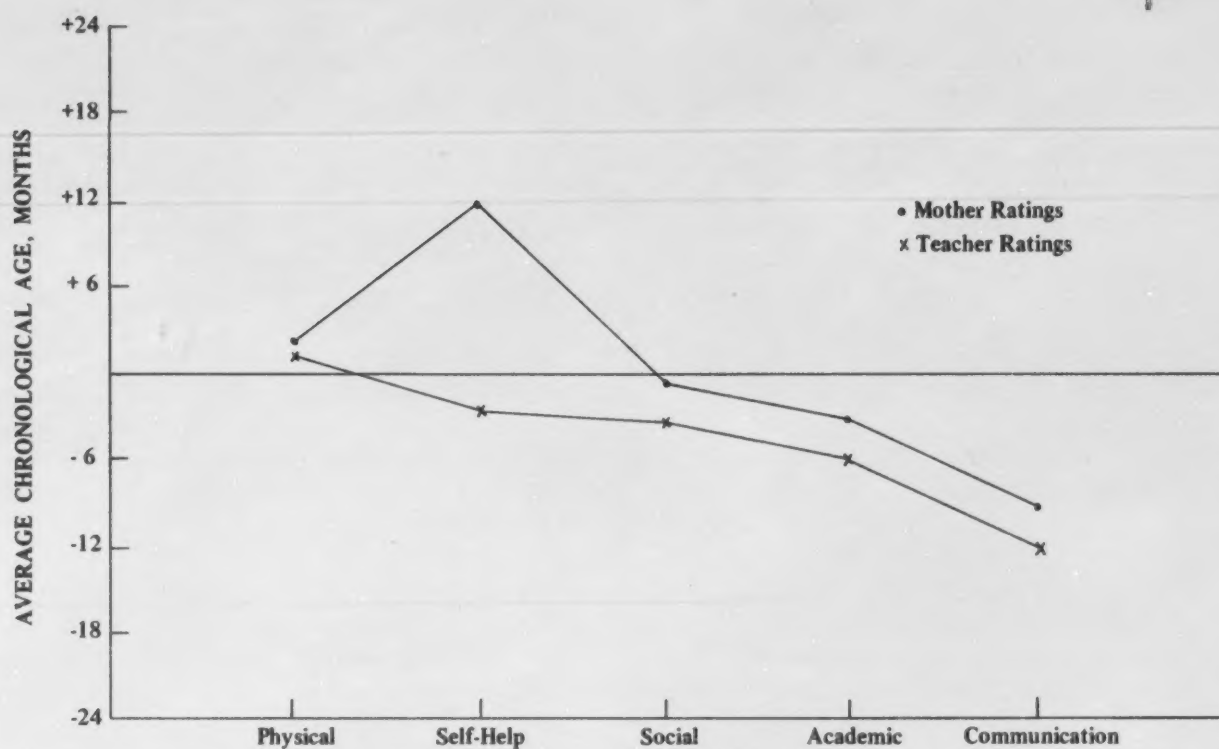


Figure 1. Alpern-Boll developmental profile (Composite profile: November, 1972)

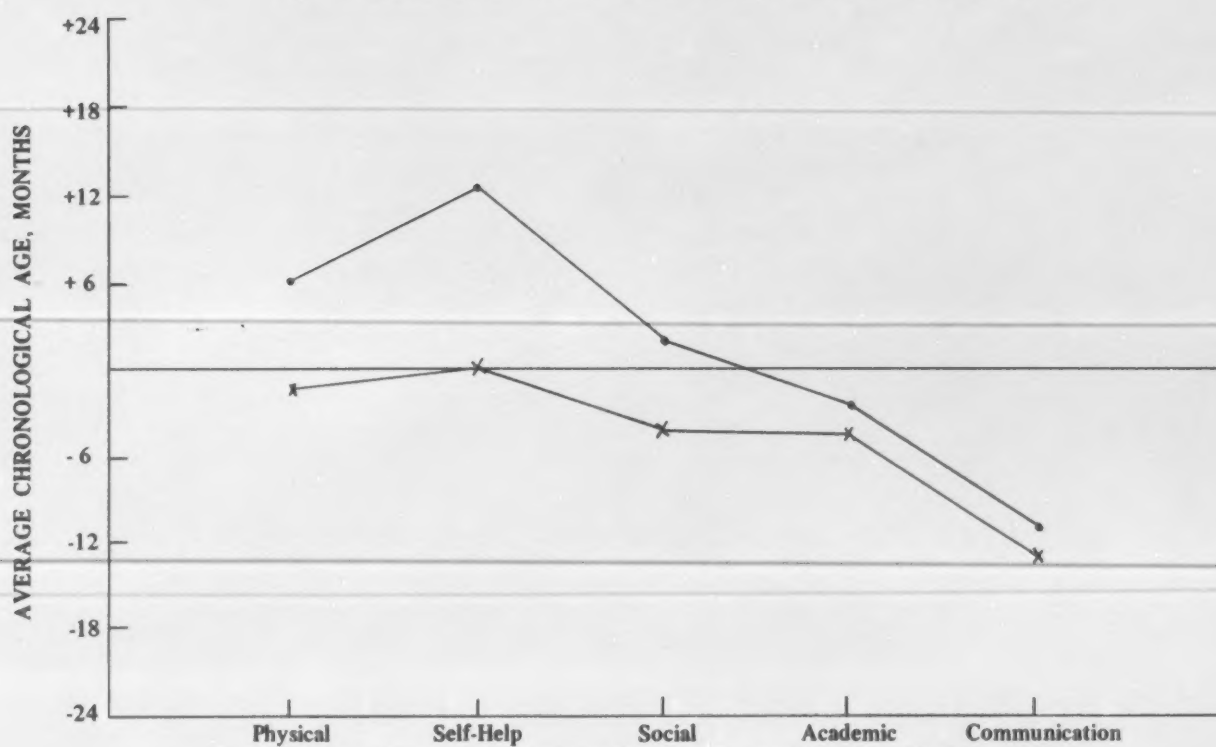


Figure 2. Alpern-Boll developmental profile (Composite profile: November, 1973)

TABLE 1
Baby Auditory Behavior Index*

0 - 24 Months

Age	Noisemakers (Approx. SPL)	Warbled Pure Tones (RE: Audi- ometric Zero)	Speech (RE: Audi- ometric Zero)	Expected Response	Startle to Speech (RE: Audi- ometric Zero)
0-6 wk.	50-70 dB	78 dB (SD= 6 dB)	40-60 dB	Eye-widening, eye- blink, stirring or arousal from sleep, startle	65 dB
6 wk-4 mo.	50-60 dB	70 dB (SD= 10 dB)	47 dB (SD= 2 dB)	Eye-widening, eye- shift, eyeblink, quieting; beginning rudimentary head turn by 4 mo.	65 dB
4-7 mo.	40-50 dB	51 dB (SD= 9 dB)	21 dB (SD= 8 dB)	Head-turn on lateral plane toward sound; listening attitude	65 dB
7-9 mo.	30-40 dB	45 dB (SD= 15 dB)	15 dB (SD= 7 dB)	Direct localization of sounds to side, indirectly below ear level	65 dB
9-13 mo.	25-35 dB	38 dB (SD= 8 dB)	8 dB (SD= 7 dB)	Direct localization of sounds to side, directly below ear level, indirectly above ear level	65 dB
13-16 mo.	25-30 dB	32 dB (SD= 10 dB)	5 dB (SD= 5 dB)	Direct localization of sound on side, above and below	65 dB
16-21 mo.	25 dB	25 dB (SD= 10 dB)	5 dB (SD= 1 dB)	Direct localization of sound on side, above and below	65 dB
21-24 mo.	25 dB	26 dB (SD= 10 dB)	3 dB (SD= 2 dB)	Direct localization of sound on side, above and below	65 dB

* J.L. Northern and M.P. Downs, Hearing in Children. Baltimore: Williams & Wilkins Co., 1974.

light coming on.

By the time the child is two years old, play audiometry procedures can be used. The child is taught to do something when he hears the sound (i.e., putting a ring on a dowel or dropping a block in a box).

The next training is for measurement of speech reception threshold or an estimate of speech sound discrimination. Pictures are used. The child is first taught to put a matching object on its picture in response to the word which he hears. Later, he is able to point to the pictures of the words. The two-and-one-half to three-year-old hard-of-hearing child can usually be trained for this task. A deaf child takes longer, or may never be able, to point to pictures in response to an auditory signal in the absence of visual cues.

All testing is done at very short test sessions, a maximum of 15 minutes. Testing is frequent so that a complete audiogram and/or measure of speech reception or speech sound discrimination is obtained over as many as five to ten test sessions. The teacher accompanies the child to testing and serves as the test assistant.

All basic test procedures need to be modified to suit each particular child. If a child is visually impaired, it may be necessary to condition him to touch so that he will feel the warmth of a light in response to sound. Another child may respond well to a hand-held vibrator. It is imperative in testing to search until some behavior is observed which can be conditioned in order to obtain consistent responses to sound. Sometimes a behavior modification task must be used; the child is reinforced by some kind of token such as cereal, a cracker, or a marble for each correct response.

Crib-o-Gram

At Stanford University, a procedure has been developed for screening infants in the newborn nursery. This is called the Crib-o-gram. The basic elements of the Crib-o-gram system begin with a motion-detecting transducer on each crib. The output from these transducers is fed to a multi-channel strip chart recorder in another room by wall plugs in the nursery. The recorder monitors up to eight cribs simultaneously. A test sound from ceiling loudspeakers is introduced midway through a sixteen-second motion recording period. Hearing responses are then scored by comparing the motor activity of the baby during the pre-sound or baseline recording against activity changes immediately after the test sound. The system is completely automated so that each crib is tested 20 times in 24 hours and the recordings for all babies are scored once a day.

The type of sound influences response rates. The cribside sound level for all testing has varied from 92 to 93 dB SPL. The 90 dB level is probably low enough to ensure that most babies with a hearing loss of more than 60 to 65 dB will fail to respond. The most effective sound stimulus to date has been a 2000 to 4000 Hertz band of noise which is the current standard test sound.

The follow-up of all babies who fail the Crib-o-gram begins shortly after hospital discharge. The physician of record is sent a notice that the baby failed the screening test. The baby is screened for hearing again at six months of age. The repeat screening at six months is done at a 20 dB HTL. A baby who fails is referred to regular audiology facilities. Those who pass are returned to the normal-hearing register.

Objective Audiometry

Objective hearing tests are in the process of development. These include recordings from the cortex, from the brain stem, and from the cochlea of responses to auditory signals. Currently, the procedure which appears to be most reliable is that of the brain stem recordings. However, with the brain stem recordings no response to sound can be recorded below 1000 Hertz. Also, it is necessary to anesthetize a child for the procedure.

An additional limitation of objective audiology is that all that is obtained is unaided detection levels which yield degree of hearing loss. Detection is far different from perception. There is no relation between hearing a sound and understanding and/or being able to make use of the sound. The ability to use sound is the most relevant feature. Furthermore, degree of loss is certainly not the only factor which determines developmental potential for speech and language, and it might not even be the best predictor. The temptation to overinterpret test results is present but should be guarded against. Objective measures should be no more than part of a test battery and should not be the primary technique in the battery.

Meaning of Unaided Audiogram

With a behavioral and/or objective test battery, the question arises about the usefulness of an unaided audiogram. What does an initial, unaided audiogram mean? The audiogram is a beginning and not an end. It is very tempting to immediately try to predict the consequences of a hearing loss; that is not valid. If a child is tested and gives responses which are consistent and which are within the limits of normal, there is a fairly great certainty that the child is hearing. However, if a child does not respond and/or thresholds are elevated, the meaning of the response (or lack of it) is not as

certain. The responses were simply those which were exhibited under particular conditions. Hearing loss is one possible explanation for the responses; however, the test conditions may also have contributed to the responses. At best, the initial audiogram is an indication of a need for special placement. With stability of response levels, there are some guidelines for recommending a type of amplification.

III. Aided Hearing Evaluation

As soon as there is some degree of certainty that a child is exhibiting a hearing loss which is end-organ in origin, it is imperative that the child be fit immediately with amplification. Once there is an initial estimate of degree of loss and function, the critical question becomes "how does a child operate with hearing aids in place?" This is a positive versus negative approach to the child with a hearing impairment. Attitudes and expectations about a child are very different when the child is thought of in terms of what he cannot hear (which is what the unaided audiogram is) instead of in terms of what he can hear (which is what the aided audiogram is).

Often in a classroom for the hearing impaired, unaided audiograms are hung up to show the degree of loss for all the children. Then, much of the individual child's behavior is evaluated in terms of his hearing loss rather than in terms of other factors. An example here is a conversation overheard between two children who were visiting in a classroom for hearing-impaired children. The young boy said something to a little girl. She did not reply. The young boy then said, "What is the matter? Don't you have your hearing aids on?" The little girl turned to the boy and said, "I don't wear hearing aids. I just don't feel like talking to you." Certainly, hearing-impaired children have similar feelings. How much more positive it is to describe a child in terms of what he can hear with hearing aids in place. Then there is an expectation for certain types of responses. When the responses are not forthcoming, questions arise about attention, middle ear infection, hearing aid malfunction, and all the other factors that would alter the responses of any child.

Finally, aided detection levels are a better indicant for placement of a child in a program than are unaided hearing levels.

BIBLIOGRAPHY

"Joint Committee on Audiology and Education of the Deaf: Guidelines for Audiology Programs in Educational Settings for Hearing Impaired Children," Vol. 17, No. 17-20 (1975). Washington, D.C.: American Speech and Hearing Association.

Northern, J. L., and M. P. Downs. Hearing in Children. Baltimore: Williams & Wilkins Co., 1974.

Pollack, Doreen. Educational Audiology for the Limited-Hearing Infant. Springfield, Ill.: Charles C. Thomas, Publisher, 1970.

Simmons, F. Blair. "The Crib-o-Gram, 6,000 Babies Later (Hearing Screening in Infants)". Proceedings of Grand Rounds, Division of Otolaryngology. Palo Alto, Calif.: Stanford Medical School, September, 1973.

THE NATIONAL CENTER FOR DEAF-BLIND YOUTHS AND ADULTS

Presented by Vera H. Schiller

Western Region Representative, National Center for Deaf-Blind Youths and Adults

The National Center for Deaf-Blind Youths and Adults was established by an act of Congress to provide opportunities for individualized evaluation and training for those whose combination of visual and hearing losses causes extreme difficulty in learning.

The services of the National Center are available throughout the country either at the headquarters facility temporarily located at 105 Fifth Avenue, New Hyde Park, New York 11040 (soon to be moved to a permanent facility in Sands Point, New York) or through the regional representatives. At present, there are five regional representatives, and it is anticipated that by the end of 1975, there will be seven.

When a deaf-blind person is referred to the National Center, an evaluation of his specific needs is made by the regional representative, in close cooperation with the referring agency.

If evaluation and training at the headquarters facility seem appropriate and feasible, an application is made for admission and, usually, the state rehabilitation agency sponsors this training. At present, the fee structure provides for payment of \$50 a week for six weeks of evaluation; \$35 a week for 13 weeks of prevocational training; and \$88 per week for room and board. The average length of training has been nine months and the goal is to return the trainee to his home community for further services, including employment.

To be eligible for admission to the headquarters facility, a client must have basic self-care skills (dressing, feeding, etc.). In most instances, it is preferable that the trainee be over twenty-one and, therefore, not eligible for further educational services, but this is not a hard and fast rule since many clients have never been enrolled in a formalized educational program. The upper age limit is usually set by the referring agency and rarely exceeds age sixty.

For many clients served by the National Center, a referral to the headquarters facility is not feasible for a variety of reasons. Those clients are served by the regional representative, who attempts to find appropriate resources within the local community. Sometimes, these resources are

recreational; sometimes, training can be provided within community agencies, some of which may have an "affiliate" relationship with the National Center. In "affiliate" agencies, the center provides temporary funding, and training, for a specialist in services to the deaf-blind. There are three such "affiliates" at present, with plans for expansion of this aspect of the National Center's role.

Many of the clients served by the National Center lost their vision and hearing as a result of maternal rubella quite a large percentage were congenitally deaf, were educated in a school for the deaf, and became legally blind as a result of retinitis pigmentosa. There are also many other causes of deaf-blindness.

All training at the National Center is highly individualized; the staff-client ratio is one to one; and appropriate follow-up services are provided.

In addition to its direct services to clients, the National Center conducts continuing research into aids and devices such as phone aids, signaling devices, etc., which will enhance the independence of a deaf-blind person. It also has an extensive program of community education which focuses attention on the special needs of deaf-blind people and the ways in which these needs can be met. Robert Smithdas, who is deaf-blind, is the Director of Community Education and edits Nat-Cent News. This is a quarterly publication, containing many items of interest to deaf-blind people and those who serve them. It is available at no charge in large print and braille editions. Those who would like to receive this publication can write directly to Dr. Smithdas at the headquarters facility.

Responsibility for developing and maintaining a National Register of all deaf-blind persons is also assigned to the National Center, which is working toward this goal in cooperation with the ten regional centers for services to deaf-blind children. This will ensure that deaf-blind people can be kept informed of opportunities and services available to them.

Finally, the National Center provides training to professionals involved in work with the deaf-blind population through training seminars held regularly both at the headquarters and in the field.

Further information about the National Center can be obtained from the headquarters or from any of the regional representatives. Your interest, your help, and your inquiries are welcome.

LIVING SKILLS CENTER FOR THE BLIND

Presented by Philip H. Hatlen
Professor, San Francisco State University

In California alone, approximately 200 blind students graduate from high school each year. Some of these graduates continue their education at the college level, some obtain employment, and some are placed in extended work evaluation programs. The majority of these young people, however, continue to live at home with no definite future plans.

Several years ago, a group of professional workers for the blind began sharing their concerns for the status of blind high school graduates. Both public high schools and residential schools for the blind were graduating students who had performed well in academic subjects. The future appeared promising for them - many had achieved at a level comparable to their sighted peers. Why, then, were so many of them continuing to live at home? Why were they not employed, or even searching for employment? Why were they not moving out, confidently and independently, beginning lives of their own?

The answers to these questions are complex, but one factor soon became apparent. The stress on academics in schools geared to the sighted had resulted in little or no preparation in independent living skills. The problems encountered in acquiring basic living skills are unique for the congenitally blind. They have no opportunities to visually observe the countless skills and tasks performed by parents, siblings, and sighted peers when they are far removed from traditional academic learning. Many have never cooked a meal, vacuumed a rug, shopped for groceries, or balanced a checkbook, and are in many ways unprepared for independent life in the community.

Six project activities have been identified which should better prepare blind youth for adult life:

1. Orientation and Mobility Skills
Instruction in orientation and mobility in order that the blind learner will be able to travel independently in the environment in which he will function.
2. Communication Skills
Instruction in communication skills so that the learner will develop adequate writing, verbal, and listening abilities.
3. Living Skills
Instruction designed to facilitate the blind individual's ability to groom himself, cook his own meals, clean and care for his own belongings, manage his personal finances, and use whatever facilities

(stores, banks, etc.) he needs.

4. Social Skills

Instruction and counseling designed to help the blind person experience productive and satisfying interaction with others.

5. Recreational Skills

Instruction designed to increase the repertoire of activities which are satisfying and enjoyable for the learner's leisure hour.

6. Career Education

Instruction in work behavior, and exposure to a variety of jobs so that the blind person will have the opportunity to select employment of his choosing.

Additional outcomes will be:

1. Demonstration of a unique service for the blind which may serve as a model for others.
2. Development of instructional materials and techniques which may be worthy of dissemination.
3. Development of evaluation techniques. Unique instruments are being developed which will measure baseline living skills performance and document change due to instruction.

The project is residential and operates 12 months a year. There are no classrooms since instruction in independent living skills is best offered individually and in the learner's own apartment and the community.

One of the unique features of this project is that its physical facility closely replicates independent living in the community. It is not a school or institutional setting, nor does it operate on the basis of classes or school periods.

The instructional staff consists of five teachers and three teacher assistants. Two teachers are specialists in orientation and mobility, two are living skills teachers, and one is a vocational specialist.

Evaluation

Behavioral-based evaluation instruments have been preliminarily developed for the first five activities listed. For career education, work has begun on developing a measurable hierarchy of career awareness, selection, training, and placement. These instruments will be administered on a pre- and post-test basis. Weekly progress reports on all participants will be provided by the staff.

CALIFORNIA INDUSTRIES FOR THE BLIND, INC.

Presented by Linda D. Walker
California Industries for the Blind, Inc.

In January, 1972, California Industries for the Blind, Inc., ceased operation as a state-owned terminal workshop for the blind.

The now private, nonprofit C.I.B. consists of a rehabilitation unit operating within an industrial setting.

Through referrals from the State Department of Rehabilitation, C.I.B. has been providing services in the following areas to blind and visually impaired individuals and to persons of other disabilities as well. (These services are free of charge, under vehicle of block funding): orientation, housing, mobility, work evaluation, work adjustment, work experience, training and placement; as of January, 1975, a specialist for deaf-blind adults has been added to the existing staff of counselors and specialists.

C.I.B. produces and markets substantial quantities of merchandise to federal, state, and commercial customers. In addition to existing product lines, C.I.B. manufactures or assembles products on a contract basis for commercial customers and is thus able to provide a diversity of jobs for both its employees and also for the trainees who are involved in the rehabilitation program.

California Industries for the Blind, Inc., has maintained a flexible program so that the needs of each individual can most effectively be met. Ultimately, it is the goal of C.I.B. to offer employment to blind and visually handicapped persons either by placement within the C.I.B. facility itself or placement outside of C.I.B. in the area most suitable for the individual.

THE GEORGE MILLER JR. WEST MULTIPURPOSE CENTER

Presented by Marjorie Greeley
Director, Hilltop Developmental Center, Richmond, California

The concept of development centers was formalized in 1957 when parents with severely handicapped children sought service in regular day care centers. In 1965, Senator George Miller, Jr. obtained funds for the county to build two multipurpose centers for the severely handicapped. In 1968, the Miller West Development Center in Richmond, California, was created to provide a dynamic day treatment program for multihandicapped and severely retarded people of all ages. The center is jointly funded by the County Department of Education and the county medical services. There is a large outpatient treatment program for children with learning disabilities.

There is a twin facility to serve the eastern part of the county; both of these facilities are administered by the county school board and medical services. Infants, children, and adults who need a day program because of developmental lag, questionable brain damage, autism, physical handicaps, sensory deficit, or retardation may be referred to the center. Referral can be made by parents, physicians, public health nurses, schools, or other agencies. Diagnostic evaluations are made by the teaching staff, staff pediatrician, physical therapist, psychiatrist, language therapist, and social worker. Staff works very closely with families.

Presently, this center serves sixty-seven people, ranging in age from 10 months to 55 years. Younger children are served as outpatients. The county school board is legally responsible for students to 21 years of age. The program for the 27 adults attending this center is funded with Mental Health money. The majority of children and adults live with their natural families; some live in board and care homes. All are provided daily bus service. There is a teacher and two instructional aides for every ten children. Therapy and School staff plan for the children's needs. Some high-school trainable mentally retarded students work as volunteer aides. Some of the adults in the program also function as aides. Several leave to enter other programs such as a school for orthopedically handicapped, a trainable program, and some have been able to attend regular schools. The center is open for 12 months.

There are 90 development centers in the state of California administered by local school districts. Unfortunately, most of them are not run as a cooperative multipurpose facility to serve the birth through adult-age multihandicapped.

MENTAL HEALTH SERVICES FOR THE DEAF

Presented by Kathryn P. Meadow
Associate Adjunct Professor, University of California, San Francisco

Mental Health Services for the Deaf has an interdisciplinary staff -- psychiatric social workers, psychiatrists, educational psychologists, social psychologists, teachers, and videotape technicians -- so that they are able to look at the deaf from many different aspects. They also look at deaf individuals of all ages and developmental levels.

A longitudinal investigation is being completed of 40 subjects who have been studied over a period of 6 years, beginning at age 2 1/2 - 4. All children chosen had at least an 80 dB hearing loss, had no other handicaps, were at least of average intelligence, and were enrolled in a preschool program. At the outset, 4 of the children had some form of manual language, and now 20 have.

The philosophical school which Dr. Meadow represents views sign language from a multilingual point of view -- the more languages a person knows, the more likely he is to succeed in communication. Several children involved in the longitudinal study were shown on videotape. One was shown signing a nursery rhyme with several members of her family. The age of fantasy is one which often passes a deaf child by, since enough verbal language is usually not learned by this time to enable the child to participate in complex thought and emotional experiences. The girl was shown teaching the fairy tale to a baby sister. Her self-esteem was intact because she had something to offer a younger sibling. She wasn't left behind as many handicapped children are.

Another little girl, of average intelligence, was also shown on videotape. She started total communication at 19 mos. She was attending an oral preschool, but her parents wanted to be able to communicate with her immediately, so they added fingerspelling and signs to their oral communication. She caught on very quickly and was forming letters far before they thought it was motorically possible. At the age of 5, she was reading at a second grade level.

People often have low standards for the deaf. Teachers of the deaf should have a good familiarity with normal development and expect it when no other handicaps are involved. Those teaching the multihandicapped deaf should also be aware of what is possible for the deaf to accomplish and keep this in mind.

When a deaf child is born into a hearing family, this qualifies as a crisis. The Mental Health Services for the Deaf conducts a group for these families. The group is run by a mental health specialist and an educational specialist. They bring different perspectives and can give parents two kinds of expertise.

The basic philosophy used by the MHSD is that they want the deaf to succeed. The more possibilities open to them, the more chances there are for success.

THE TEACHER AND THE RESEARCHER

Presented by Georgie Lee Abel
Professor, San Francisco State University

The following remarks are made as a result of some experience with all types of visually impaired children and some observation of children assigned to programs for those described as deaf-blind children. This summary raises questions and suggestions relative to the broader area of the visually impaired, but it is hoped that certain of them, brief as they are, will have some application for those of you who either teach or direct programs for those who are deaf-blind. There is no priority in the following list, nor will there be examples or elaborations due to the fact that this is a summary.

1. Teachers and researchers have a cooperative responsibility. Both have much to share in the area of good practice and in their expression of needs for more knowledge. Both should realize also that ethical practice must be considered in experimentation with children. Both should have input early in the planning of projects. A good research design is well worth the time required in the early stages. Due to our scattered and small population, our efforts can become most difficult in selecting a convincing sampling. This adds to the cost of research.

2. Both in research and in educational planning we must consider carefully the definitions we use. Can we be more descriptive when considering the amount and type of hearing and seeing the child has. Can we describe this more in behavioral terms. We have been much too preoccupied with causes, history, incidence, and prevalence. While these are important, they don't tell us often what we need to know about a child's functioning and our enhancing his learning.

3. Technological research and actual hardware developed for the use of human beings is costly and often seems to stop just at the point at which it could be marketed. The field testing does not seem to take place or become documented in a way that provides real information for us. We need both psychologists and engineers to work together with the sampling under consideration. Often, after an idea has been developed to a prototype stage, too many improvements have to be made before a device can be used comfortably or managed by the handicapped person for whom it had been designed. The obvious areas are with respect to hearing, seeing with limited vision, tactile, use of devices in school tasks, and in mobility.

4. We need to consider perception in relation to the children whom we teach. Perhaps more than visual acuity, and the above-mentioned etiology, our observation can help us deal with the problems of color, light, and depth perception in the child's ability to move about in his environment, and the relation of his directional hearing which often assists him in those things which cannot be seen at certain distances.

5. We have so often mentioned a multidisciplinary approach and then promptly moved back into our specialization as we study children. We have no choice today but to draw on the knowledge of all professional areas if we are to understand well enough to teach these severely multihandicapped children. Persons from other areas of exceptionality, such as psychological services, medical services, and social services, must be invited to share in the responsibility.

6. We need to continue to pursue research dealing with the dynamics of the family and with services to children. We are getting much better materials written for people at all levels, but real research is difficult and while we do have some good studies we need more. We need to take advantage of the work of authors who have tried to help us study ourselves with respect to our sensitivity. Again, in addition to the teacher, others need to be involved in both this type of training and actual service.

7. Perhaps we have a better opportunity today to study ourselves than ever before. The self-esteem scales and self-concept research along with many aspects of the affective domain have brought a new beginning for many of us. Those who are more action oriented in the social aspects of the community and the legal rights of the handicapped have given us some new ways of thinking and have perhaps generalized a bit more than we have been accustomed to, by such simple statements as: "We are not really able to understand others and help them unless we have first tried to understand ourselves." The concept of the advocate in the community or school, the interpreting person of both the child's needs and his potentialities can often make a difference in the life of the child we are considering. As we become more sensitive, we shall be able to feel more a part of a strong movement to assist the children assigned to us and certainly their parents or guardians. I have known teachers of deaf-blind children in various types of schools express their professional loneliness largely due to the fact that other teachers do not know their program and they find it difficult to find that day-to-day contact which helps them share their professional successes and problems. No doubt as our teachers are better prepared they will be able to reach out more to share what they are doing and perhaps to gain knowledge that they can use from teachers of other types of children. It is exciting to observe the big and important job that teachers are doing. It is hoped that others in other areas of education will gain more knowledge about these children and about

the all important teaching that makes a difference in the lives of so many. There are many inspiring stories, but a summary does not permit the telling. Fortunately, when teachers get together at institutes and conventions, they do have the joy of talking about their children with people who really understand.

NATIONAL TRENDS AND PRIORITIES IN SPECIAL EDUCATION

Presented by Philip J. Burke

Branch Chief, Division of Training Programs, Bureau of Education for the Handicapped,
U.S. Office of Education

First of all, let me begin by stating that I don't believe anyone knows what is going to happen in the next two years in the field of special education, let alone the next five or ten years. The prediction of trends and events is, at best, a futile effort. We have all participated in Delphi probes and other surveys, but these instruments produce mere catalogues of current thought, based on current practice and conditions. Who could have predicted the Pennsylvania case or Judge Waddy's decision in Mills vs. the Board of Education in the District of Columbia.

Much of what affects our programming and decision making is beyond our "mere power to add or detract" and is unpredictable. Perhaps Tolstoi was right when he wrote in the first chapter of War and Peace that in historical events men are mere labels serving to give a name to an event: "Every action of their own free will, is, in an historical sense, not free at all, but in bondage to the whole course of previous history." Tolstoi's view is pessimistic, even cynical, but so frequently true.

Having established that prediction or event forecasting is not very practical, perhaps the most useful exercise would be to identify issues that are with us on some scale about to surface. As some of them have negative connotations, they deserve immediate consideration. I would like to offer some thoughts on the following issues: Mainstreaming, Teacher Organizations, Teacher Surpluses, Competency-Based Teacher Education, and Severely Handicapped Programming.

Mainstreaming

Very frequently we special educators get caught up in trends and they become encrusted with jargon-laden slogans. In the early 1950's there were a few studies and published articles that concluded that many retarded children in regular schools and classrooms were isolated from their normal peers. They were gaining little from the academic program and, in terms of socialization, they were effectively cut off from normal interaction. The solution at that time was the creation of special classes to provide a more appropriate educational climate, while not losing in the socialization area since it was felt the children were isolated anyhow. Perhaps with a better academic preparation

the quality of their socialization would go better, or so it was believed. Thus ensued a widespread trend towards the creation of special classes.

The period of special class formulation was followed by a period of study involving a questioning of the efficacy of the special class. This period extended through the mid to late 1950's and early sixties. The studies reported mixed results, but the basic findings were that the special class was not preparing the exceptional child any better than would have occurred had he remained in the general classroom. Some studies reported an advantage to the special class on the self-perception and socialization scales, but these findings were also criticized because the social mix studied was the handicapped with the handicapped as opposed to a normal peer group.

In the mid-sixties we experienced journal articles calling for an end to unnecessary labeling and the special class for many exceptional children. The Lloyd Dunn (1968) and McMillan (1970) articles would be examples of these. Thus, a trend toward integrating more handicapped children into the general mainstream of education has ensued and the term "mainstreaming" has been coined to label the movement. Perhaps the authors of journal articles describing these trends have fulfilled the role of labels for events depicted by Tolstoi. Perhaps not.

To make any sense out of these trends one must look at the problem. The isolation of the handicapped cited by Orville Johnson in the 1950's exists just as strongly today. Our CLOSER LOOK program recently received a letter from a young girl asking if we could help find a special school for a retarded girl in her class. In the letter she expressed her grievances. It seems the retarded girl was given too much of the teacher's attention and she received good grades for what normally would be classified as inferior work. The young girl felt that her retarded classmate should be placed somewhere more suitable.

That letter in many ways points out the major response society and the schools have had towards the handicapped.

From the earliest times in recorded history man has feared and felt uncomfortable about the handicapped, frequently expressing these feelings by isolating the handicapped in many ways, mainly in segregated institutions.

Institutions, particularly for the retarded, almost by their very nature of operation are dehumanizing and frequently cruel. The quality of humanness and life tolerated in such a setting frequently approaches a least common

denominator that provides a standard of life barely humane, and frequently it is inhumane. Many of you may have seen the pictorial essay Christmas in Purgatory published in 1966. The pictures in that book appeared in Look magazine and there were great outcries from the people. And Look received more letters concerning that article than any single prior item. But we still incur our Willowbrooks and other similar institutional settings almost ten years later.

In each instance the institution is created for the good of those it is designed to serve - in the end it does not. Two thousand years ago it was said of the Roman Senate that:

"The Senators are all fine men; it's the Senate that is such a beast."

Perhaps, the wisdom in that statement concerns individuals when they come together with a set of rules in an institution.

Perhaps, by even allowing the handicapped to be shunted aside and physically isolated, we have predestined them to further isolation. They are not commonly involved in society; not seen, they do not interact. Thus, people are not accustomed to seeing the handicapped, talking to the handicapped, or dealing with the handicapped on an everyday basis.

People get used to not having them around, and the handicapped get accustomed to not interacting with their normal peers.

Much of this feeling and the genuine concern that such isolation violates the constitutional rights of the handicapped has led to the strong advocacy of a more normalized setting for the handicapped.

Normalization, particularly discussed here in the context of the schools, is also widely discussed throughout the social service areas as well. The whole de-institutionalization and community-based home and half-way house movement for the handicapped is part of this.

The court suits and legislation have caused severely handicapped children, who had been excluded from schools, to be included in a program of education by the schools as a constitutional right of equal treatment and equal protection under the law.

In the case of "mainstreaming" or normalization, I am concerned that

many well-intentioned efforts are creating many problems for the handicapped. While strongly endorsing the basic process of normalization, I caution that much has to be done with those schools and institutions that segregated and isolated the children in the first place.

First, we must deal with the attitudes, fears, and anxieties people have built up over the years. Principals, teachers, and teacher aides are human and in most instances they have had little experience with the handicapped and no formal training. We special educators have allowed them for years to feel little responsibility for the handicapped. And changes in this manner of operation and the system are going to have to be made. A massive inservice training effort concerned with skills and attitudes must be conducted.

Our special education personnel will need to acquire new skills. In addition to working with children, they will need to work with the teachers and principals of the schools that will now serve these children. There are many problems within this movement that will necessitate massive retraining, new preservice training, organizational and administrative arrangements that will allow a greater compatibility of materials and instruction.

In our quest to normalize the school environment for handicapped children, we must not fail to realize they still need extensive services and these services probably will have to be even more intense than what has been provided to date.

Teacher Organizations

At a time when the trend is to put the handicapped into the general classroom we are experiencing a generally unfavorable and frequently hostile reaction to widening the range of diversity of children in the general classroom. Teacher organizations are increasingly concerned with defining their working conditions. Those conditions include the numbers of children per classroom as well as the relative homogeneity of those children.

Recently, I participated as a judge or panelist for a research effort and evaluated five teacher contracts from a midwestern state. I was asked to evaluate the potential effect, both positive and negative, of those contracts on handicapped children. If the provisions of those contracts are literally followed, the effect on programming for handicapped children could be devastating. In some contracts teachers were made the prime force and voice in determining who would or would not be tolerated in the classroom. The academic homogeneity of the classroom was stressed. Such an attitude,

negatively expressed in a contract, could seriously disrupt any planned mainstreaming effort.

In one contract the administration was given one hour per month to do whatever they wanted in a faculty or inservice meeting. Sixty minutes, and the contract specified that teachers could leave immediately when that time was exhausted. You can imagine the effect this will have on the re-training efforts required if a successful mainstreaming program is to be implemented.

Many of these restrictive clauses in contracts have been caused by years of neglect, and by ineffective and wasteful inservice practices, coupled with teachers who were relatively unsupported in the classroom with satisfactory ancillary services. If trends in contract negotiations continue in this manner and, concurrently, special educators encourage that more handicapped youngsters be incorporated into general education programs, we shall be on a collision course and our children will be the losers - as always. In the words of Kurt Vonnegut, "So it goes!"

Teacher Surpluses

The newspapers have been full of headlines regarding the surplus number of teachers and the declining school enrollments. These surpluses, whether real or imagined, have caused a number of problems:

First, I would argue there is a surplus of general classroom teachers, but this fact is a result of a limited demand. And I would argue that with enrollments of 30 and more children per classroom in many areas, with double sessions in many schools, and with the severe limitation of ancillary but essential services, there is no shortage in the sense of real need. And we educators who tolerate such educational practices are to blame for our current plight.

Second, the actual surplus has spilled over into the vacancies that have existed in special education. At a time when we had just begun to approach a reasonable supply/demand pace of qualified educators for handicapped children, many of the vacancies that would normally have been available have been filled either by the many available general classroom teachers or re-positioned teachers resulting from the decline in enrollments. So it goes!

Third, the mere headlines and talk of teacher surpluses and declining enrollments has caused a widespread disinterest and cynicism about further

investments in educational personnel training at a critical time. Just as we are becoming capable of attending to the issue of quality on a pre- and in-service basis, it is getting increasingly difficult to justify the investment needed to obtain the desired quality. So it goes!

Competency-Based Teacher Education

One of the most popular acronyms today is CBTE or Competency-Based Teacher Education. The concept of defining the role a teacher can fulfill and set of skills a teacher possesses is excellent, to the extent it is possible and desirable to do this.

However, we are at the very beginning of our programming in this area. Much of the competency material I have seen so far has come from surveys, questionnaires, and literature searches - all of which is necessary to begin formulating a good CBTE program. What remains is the validation of the competencies and skills. This task is mammoth, but it must be undertaken. Further, many questions still remain. For example can we really teach many of the skills a teacher must have? Can we teach them to like children, to take joy in their learning, to be robust and resilient in the face of defeat, and to be industrious and honest in their commitment to the profession? Perhaps by pursuing the CBTE movement to the fullest in an effort to define what can and cannot be done, we can finally answer some of those centuries-old questions about the degree to which teaching is an art or a science. Perhaps we can even define the standard for success. An electric light is only 5% efficient, giving off approximately 95% heat and 5% light per unit of electricity consumed. However, electrical engineers have defined the standard so that such an outcome is acceptable. Can we not do the same in teacher education?

But in this pursuit we must be diligent and honest. A telephone-book-sized printout of lists of competencies may look impressive; however, the proper implementation and vitality of the system require appropriate formative evaluations and supervision with provision for constant checks on the validity of the entire program.

Programs for the Severely Handicapped

In my opinion the most exciting thing happening in special education is the judicial interest in the severely handicapped individual. Finally, after

years of petitioning school boards, parents have gone to the courts and have caused an upheaval in special education that no one predicted. It is my understanding that at last count there were over 25 cases either adjudicated or on the verge of such status, usually in favor of the plaintiff - the parents of the handicapped. But the dream of good services for their children will go unrealized if we the professionals involved in the education of these children cannot deliver. If we cannot provide the proper training both pre- and inservice, proper guidance, proper leadership, then the series of court orders may only lead to further frustration on the part of parents and children. We cannot afford such a letdown.

Also, there are potentially explosive counterforces on the horizon. In one state in the Northeast, the newly legislated services for the handicapped are being purchased with general education funds. Special education draws first and the expenditures for the first year of the new legislation have more than quadrupled. You can imagine the impact when fewer funds are available for the general programs, in a state that is virtually bankrupt.

On the federal level there is a good deal of legislative interest in the provision of an excess cost arrangement. But new legislative initiatives are coming forth at a time when appropriations in education are by no means supple. Thus, even if new measures become law, the question of funding still remains.

Generally, each of the points I have raised here today affects the severely handicapped most critically. As usual, they are the most vulnerable, the most defenseless; and they stand to lose the most.

CLOSING REMARKS

Presented by Jackie Coker

Teacher-Counselor, California State Department of Rehabilitation

At the age of seven, I lost my hearing and vision completely as a result of spinal meningitis. I did not go to school immediately after that, because, since I lived in Arizona, there was a question on where I should be sent. In 1946 I left Arizona and completed my high school training at the California School for the Blind, Deaf-Blind Department. Later, I attended the University of the Pacific and obtained a B.A. in sociology. Now I work for the State Department of Rehabilitation in Sacramento as a teacher-counselor.

Although I have not worked with small deaf-blind children, I know it must take patience and determination to do it. A teacher must repeat 50 times before the deaf-blind child will understand. Possibly some never do, but the time is not wasted, because there is still the fact that someone took the time and effort to help. A teacher should have insight and understanding. Find several different ways to express your thoughts and feelings. It is easy to misunderstand what the child is trying to say, and, in so doing, the teacher may give the child the wrong information. This misunderstanding can damage the teacher and pupil relationship. The deaf-blind child does not have information readily available to him as others do, and so, he must rely on others to help him. The child will lose confidence and trust, and the uncertainty and insecurity will interfere with the content of work and will surely slow it down. Speaking from my own experience, I ran into many confusions and had many strange ideas as a child.

What will a deaf-blind person do after he ends his education? Can he be a useful, working citizen? Yes, if given the opportunity. Presently, I am working toward getting deaf-blind people jobs. I am a counselor-teacher, not a rehabilitation counselor. I help the clients adjust to their handicap and help them with their communication and daily living skills, or whatever other help they may need. I usually work with the blind who became deaf or the deaf who became blind. If the blind become deaf, I usually concentrate on teaching the manual alphabet, teletouch machine, and finger printing. If the deaf become blind, I teach them braille, typing, handwriting, and help them adjust to their conditions -- if anyone can adjust to it.

Question and Answer Period

1. How many forms of communication do you have?

Jackie: I have four -- manual communication, lipreading (Tadoma),

palm printing, and braille.

2. How much are you attuned with the world? Is there a difference finding out information from someone else?

Jackie: Most of the time I do guesswork. Also, I read the braille newspaper, and I can tell what is happening around me through vibrations and most of the time I know the personality of the people.

3. What makes a person difficult to lipread?

Jackie: They talk too fast or don't move their lips much. Accents are hard for me. A child's face is too small and if a man is wearing a beard, his whiskers cover his lips.

4. Are there any special appliances in the apartment to help you?

Jackie: No.

5. How do you communicate at work?

Jackie: I lipread the other person and use whatever method the client may understand.

6. Where have you traveled?

Jackie: Mexico, Canada, Hawaii, New York. I have not been across the ocean to foreign countries.

7. Whom do you live with, and how do you spend your leisure time?

Jackie: I live with a family with two sons -- ages, 14 years and 12 years. We fight and argue, but we get along well. During my leisure time, I go for walks, play scrabble, read, and talk.

8. Do you object being asked personal questions?

Jackie: No. I like to ask questions as well.

9. Jackie: How many of you will teach Tadema?

Response: 11 (11 participants out of 60 raised their hands).

- Jackie: Tadoma is difficult to do and teach, but it is very handy to the deaf-blind child as he gets older.
10. Jackie: What would you do if a deaf-blind child screams and kicks on the floor?
- Response: Leave him there.
- Jackie: Good answer. Let the child know he is doing something bad.
11. What if the child doesn't realize it?
- Jackie: Well, there are psychopathic handicapped people, too, who don't know right from wrong.
12. How do you move around on the job?
- Jackie: I usually can get around by myself. If someone shows me the way first, I will memorize it. I visit clients alone, and if I need to get around in a car, the taxi driver will help me.
13. As a child, how did you feel about being different?
- Jackie: I knew that I couldn't see or hear. I didn't know anything was wrong with me or that I was different or unusual until after I graduated from high school. Then, it was difficult for awhile.
14. Did you have speech therapy?
- Jackie: Yes, but not anymore. Someone will tell me if I mispronounce a word. If my voice is too soft, the people just lean forward, then I know.
15. How do you shop for clothes?
- Jackie: My friends go shopping with me and suggest something, if it looks nice. I will try it on, but if I don't like it, I won't buy it.
16. Do you want to write a book?

Jackie: I would like to write one based on fiction of a deaf-blind girl who corresponds with a friend and tells her the problems and feelings she has. It has to be fiction because it is easier to say things. Otherwise, if the people are real, trouble starts.

17. Would you like anything to change in terms of people relating to you?

Jackie: I wish they wouldn't treat me as a moron until I prove to be one.

Minicourses

PREVOCATIONAL TRAINING

PART I

Presented by Charles J. Zemalis
Coordinator, Prevocational Program, California School for the Blind

Students were asked to remain silent, not manipulate anything for ten minutes, and meditate on the following thoughts:

Humans require stimulation. There is a fine line between boredom and fatigue, and it is different for each person.

"What is work, and what is not work are questions that perplex the wisest of men." Baghavat Gita

"Work makes life sweet." German Saying.

After meditating for ten minutes, the participants offered the following ideas:

"Work is activity which occupies both the mind and body."

"I have a job; it's not work; it's not the work I want to do."

"Work is doing something. A job is more what you want to do."

"Obeying the rules is work. Doing what you feel is not work."

"One criterion is whether you would do it whether or not you get paid. Self direction and making your own decisions have lots to do with it."

"Do the work which is most meaningful to your life."

The following handout was distributed to the participants.

PRECAREER TRAINING

Some Attitudes Concerning Work

Do you agree or disagree with these statements?
(Circle "A" for agree and "D" for disagree)

- A D 1. "Work is physical or mental effort exerted to do or make something."

- A D 2. "To work is to pray."
- A D 3. "Like every man of sense and good feeling, I abominate work."
- A D 4. "One of the saddest things is that the only thing a man can do for eight hours a day, day after day, is work. You can't eat for eight hours a day, nor drink for eight hours a day, nor make love for eight hours a day."
- A D 5. "A man who has worked himself to death must be a 'good' man."
- A D 6. "To crush, to annihilate a man utterly, to inflict on him the most horrible of punishments so that the most ferocious murderer would shudder at it and dread it beforehand, one need only give him work of an absolutely, completely useless and irrational character."

PART II

Presented by Charles J. Zemalis
Coordinator, Prevocational Program, California School for the Blind

The following questionnaire was given to each participant:

DEAF-BLIND CAREER TRAINING PROGRAM

Questionnaire

Circle answers to the following questions from 5 to 1

5 - Enthusiastic, 4 - Comfortable, 3 - Indifferent, 2 - Noncommittal,
1 - Negatively

How do you feel about deaf-blind young adults being:

1. Employed as baby-sitters or nursery helpers?
5 4 3 2 1
2. Given pets to care for?
5 4 3 2 1
3. Prepared for work in sheltered workshops?
5 4 3 2 1
4. Discouraged from begging in public?
5 4 3 2 1
5. Prepared for television viewing and/or music listening
as their most reasonable adult occupation?
5 4 3 2 1
6. Employed as janitors?
5 4 3 2 1
7. Prepared for a lifetime in an institution?
5 4 3 2 1
8. Employed in commercial kitchens or bakeries?
5 4 3 2 1
9. Taught how to live on government subsidies?
5 4 3 2 1
10. Taught from traditional school texts?
5 4 3 2 1

11. Prepared for college entrance?
5 4 3 2 1
12. Prepared for technical school?
5 4 3 2 1
13. Exposed to sex education?
5 4 3 2 1
14. Encouraged to ride public buses alone?
5 4 3 2 1
15. Encouraged to marry?
5 4 3 2 1
16. Prepared for parenthood?
5 4 3 2 1
17. Sterilized?
5 4 3 2 1

Responses of Teacher Group to Deaf-Blind Career Training

Program Questionnaire

Rating scale: 5-Enthusiastic, 4-Comfortable, 3-Indifferent,
2-Noncommittal, 1-Negatively

	5	4	3	2	1
1. Employed as baby sitters or nursery helpers?	6	13	5	5	1
2. Given pets to care for?	25	4	0	0	1
3. Prepared for work in Sheltered Workshops?	23	7	0	0	0
4. Discouraged from begging in public?	17	1	2	1	9
5. Prepared for television viewing and/or music listening as their most reasonable adult occupation?	3	2	3	7	15
6. Employed as janitors?	17	7	4	2	0
7. Prepared for a lifetime in an institution?	1	6	1	4	18
8. Employed in commercial kitchens or bakeries?	21	7	1	1	0
9. Taught how to live on government subsidies?	9	11	2	2	6
10. Taught from traditional school texts?	2	1	3	3	21
11. Prepared for college entrance?	5	10	1	5	9
12. Prepared for technical school?	15	10	1	4	0
13. Exposed to sex education?	21	8	1	0	0
14. Encouraged to ride public buses alone?	23	6	1	0	0
15. Encouraged to marry?	8	8	4	9	1
16. Prepared for parenthood?	8	9	2	9	2
17. Sterilized?	0	4	1	8	17

Note: 1. Several people included statements saying that all responses were conditional depending on the individual, and one person said it was impossible to generalize at all.

2. Several people questioned their own responses to the last three questions (15, 16, 17), suggesting that they had not yet resolved these in their own minds.

CALIFORNIA SCHOOL FOR THE BLIND

Deaf-Blind Precareer Program

WHAT'S BEEN HAPPENING SINCE SEPTEMBER, 1974?

Academic Training

12 hours classroom work per week.

Communications

Language, speech, listening skills, printing, and note writing. Reading is related to school, family life, and field trips. Films and film strips provide opportunities for information and communication building.

Mathematics

Practical arithmetic is related to shopping and everyday needs.

Field Trips

Each trip is the basis for classroom work. We have visited:

- 1 Local hospital dietary department
- 1 Local hospital housekeeping department
- 1 Commercial bakery
- 1 Post office
- 2 Health exhibitions
- 1 Library (public)
- 3 Museums
- 1 Aquarium
- 7 Special gift-buying expeditions
- 27 Weekly grocery shopping trips
- 10 Workshops and educational centers for the handicapped

PRACTICUM

Hospital Work: 3 hours a week

Each person receives pay for the work done here. During the year, each student will attempt 24 tasks. Tasks range from distribution of paper supplies to instrument and clinic cleaning.

Industrial Arts: 1 1/2 hours a week

Each person is occupied in making some usable object for the schoolroom, for himself, or for others.

Living Skills: 3 1/2 hours a week

Shopping: 1 1/2 hours a week

Students shop for groceries to be prepared for the following day's lunch. The goal is to choose a simple, healthful mid-day menu.

Cooking: 2 hours a week

Lunch is prepared. Individuals learn sanitation, safety in the kitchen, table setting, acceptable eating habits, and kitchen-dining room housekeeping.

Presheltered Workshops: 5 hours a week

Here the time is devoted to building up work tolerance, manual dexterity, and the discipline necessary before the trainee may enter a sheltered workshop.

Potting and planting of seeds and cuttings to be sold. Profits are used for the purchase of special items used in the program.

with teaching money management, since the children are paid 25¢ an hour. They are paid only once a month. At first all of them were paid in quarters to make it very clear how much they had worked. After a while some could understand being paid in dollars. They were encouraged to save for something. For example, one girl who liked watches very much saved for a watch.

Sick pay has been initiated into the system. This was not thought to be necessary, but when one of the workers was sick and her pay came out to be less, she complained that it had not been her fault and that it was not fair. Because of her understanding, sick pay was initiated.

The children are taught good habits of sanitation: to scrub their hands and use alcohol after finishing their work. All of these tasks will carry over well to home, institution, cottages for the handicapped, or any other living arrangement in which these children someday find themselves.

When working with adolescent deaf-blind, one encounters many problems, but before we condemn these children too severely, we must recall our own youth and problems. Deaf-blind adolescents are not just difficult children, they are in difficult stages of life. If the students in the prevocational program have a bad day and can't do their work, their teachers try to let them take a day off now and again. These children do not have the outlets for anger and frustration that we use. They don't get drunk or smoke. Sometimes a day's rest and solitude is sufficient to help rehabilitate a child. A chart is kept listing each girl's menstrual cycle. In this way, the teachers can be more tolerant of premenstrual tensions.

So far there has been very little problem with motivation. Of course this program is something new and different, and next September will provide an interesting comparison. The only problem that arose in the program last year was when one boy said that all these tasks were women's work and he was too big and strong to do this sort of work. For the most part, the children are very eager. They are now at the point that the tasks of the day are listed on the board in the classroom and they will go to the hospital unattended. When the teachers follow 1/2 hour later, the tasks are usually done.

The general aim of the program is to help the deaf-blind children to be better off wherever they end up -- be it home, sheltered workshop, institution, etc. They are not only encouraged to advance in their range of skills and adeptness at them, they are also building up a tolerance for work. It is hoped that these children will eventually go into the homes of some of the school employees to use the skills they are mastering in the program.

PART IV

Presented by Charles J. Zemalis
Coordinator, Prevocational Program, California School for the Blind

Participants were told to choose one of the following sites for a field trip, and transportation was arranged:

1. San Francisco Lighthouse for the Blind
1097 Howard Street
San Francisco
2. California Industries for the Blind
1255 Park Avenue
Emeryville
3. Berkeley Center
Member Alameda County Association for the Mentally Retarded
1007 University Avenue
Berkeley

Following the visits to the three workshops, the participants were divided into four groups and were told to respond to the following:

1. Think about the problems seen in the workshop field trips
 - a. in preparing the deaf-blind for them
 - b. in preparing the deaf-blind for sex education
 - c. in any area of the future life of the deaf-blind
2. Record them all under the headings of "Personal" and "Objective"
3. How can you use this material to help change the attitudes of your superiors, children's parents, and fellow workers?

Each group made a presentation:

Group I "Don't Knowers"

Objective

1. There should be a clear distinction between socializing time and working time.
2. Jobs should be more diverse and vocational training available.
3. Staff should be better trained in communication skills for all types of people.

4. Freedom of choice was encouraged.
5. High level functioning clients.

Personal

1. In two places they were respectful of persons' feelings; in one this seemed to be ignored.
2. Wanted more background information on clients.
3. Facilities were not adequate in terms of space or environment.

Group II "Blue Birds"

Objective

1. Sheltered workshops are necessary and provide a useful service for the handicapped.
2. Find new places for sale: door-to-door (not desirable), store fronts, YMCA, other services, better advertising, representative to demonstrate.
3. More influential donors.
4. Only the factory was seen by us; this made our interview incomplete.
5. The facility was being run as an educational setting rather than as a business.
6. The safety standards were not adequate.
7. The benefits offered to the workers were questionable.

Personal

1. Weren't many people working -- especially women.
2. The only person who seemed enthusiastic was the woman who had outside (theater) interest.
3. The people didn't seem particularly happy, but at least they were working and did seem proud of their work.
4. The C. P. man in the wood section took direction better from a fellow

worker who was blind than he did from the sighted fellow who tried to give him directions.

5. The place was dreary; it should have been made more pleasant to look at for the partially sighted workers.
6. The administrators had well-meaning intentions, but it seemed futile because they seemed locked into a particular skill.
7. Should be more variety in product line.

Group III "Free Spirits"

Objective

1. Lack of socialization typical of industry.
2. Deficiency of occupational safety, labor representation, minimum wage, and supportive services.
3. Lack of diversity of tasks for individuals.
4. No easy way of summoning assistance in training program.
5. Clients should have opportunity to view and use finished products when feasible.

Personal

1. Lack of socialization.
2. Staff seemed warm and understanding.
3. Overemphasis on fulfilling arbitrary norms of production.
4. Disparity between physical appearance of factory and staff offices.

Group IV "Broom Makers"

Objective

1. We realize that we must create different type work situations for different levels of handicapped workers, i.e., a more structured job situation at Berkeley Center.

2. Need to give the worker "freedom of choice" after exposure to what is available -- a wide variety of tasks with proper supervision and counseling.
3. Give the individual opportunity for self-improvement and advancement both in the workshop and in the community.
4. Counsel for individual self-fulfillment (life-style -- academic, social, emotional).
5. Consideration needs to be given as to how to develop these skills, i.e., within a classroom or natural situation.

Personal

1. Observed a positive social environment between (1) co-workers; (2) administrators and workers; and (3) visitors and workers.
2. M. R. workers not encouraged to socialize in a work situation (only at Berkeley Center).
3. Observed lack of "mannerisms" and "blindisms" -- thought this a positive trend.
4. Observed that workrooms were impersonal and void of interesting or warm stimuli.
5. Noticed bright, interesting classroom at Berkeley Center.

PART V

Presented by Charles Chapman
Teacher, California School for the Blind

Charles Chapman, one of the participants in the summer program, is a teacher of deaf-blind children at California School for the Blind (CSB) in Berkeley, California. He did the research involved in compiling the first part of the precareer curriculum for deaf-blind at CSB. He reviewed the number and ages of deaf-blind people within our Southwestern region. There are four 20-year-olds, three 19-year-olds, five 18-year-olds, two 17-year-olds, one 16-year-old, thirteen 15-year-olds, ten 14-year-olds, three 13-year-olds, thirteen 12-year-olds, thirteen 11-year-olds, thirteen 10-year-olds, 106 9-year-olds, fifty-four 8-year-olds, thirty-eight 7-year-olds, twenty-eight 6-year-olds, twenty-nine 5-year-olds, twenty-three 4-year-olds, eleven 3-year-olds, ten 2-year-olds, eight 1-year-olds.

These figures show very clearly that the majority of the deaf-blind population is between 5 and 12 years old. There are 18 children in pre-school, 252 of normal school age, 47 in precareer, and 7+ in careers. If these figures are projected to 1978, there are 202 deaf-blind between twelve and seventeen which are the precareer ages. For those on the East Coast there is a one-year delay, so that by 1980 there will be 236 kids who are sixteen years of age.

As these figures are analyzed, there are many other things to be considered, including the diverse levels of development of these kids. They have been broken down into five areas: (1) Self-sufficient; (2) Partially self-sufficient; (3) Those who live in a dependent situation, but work in a sheltered workshop; (4) Dependent; and (5) Custodial.

If a child is on one of the first two levels, he can be helped by vocational rehabilitation as well as by the National Center for Deaf-Blind Youths and Adults. There are no suitable programs for the remainder of the population. One must also consider the problems if a deaf-blind person were to be put on a job, such as the lack of work experience, adjusting to an eight-hour day, the lack of communication, and the overall change from a special education classroom setting. Most vocational rehabilitation programs are centered around the product, not the producer. If your product doesn't sell, you are kicked out.

Another problem lies in reaching the kids in time. Most prevocational training begins at 16 years of age. Deaf-blind children reach a peak at 9 or 10 years. At the age of 12, many of them reach an academic plateau. It is unfortunate if these kids are allowed to sit and get frustrated in an academic situation for 4 years before they begin precareer training.

A questionnaire was sent out by the California School for the Blind in cooperation with the Southwestern Region Deaf-Blind Center and the Home of Guiding Hands to study what happened to deaf-blind people after they had completed their school training. Thirty-seven questionnaires were sent out, and 18 were returned. The results showed that 12 of them live at home, 2 are in foster homes, one is in a residential institution, and one is living independently. Regarding wages earned -- 4 were earning over \$100/mo., 3 over \$200/mo., and one between \$300-\$500/mo. The remainder of them received aid from various sources -- five depended on Social Security and Aid to the Disabled, five on other state aid (Aid to the Blind), three on family support, and one on the Veterans Administration.

A questionnaire was also obtained from professionals regarding this particular population. Over half were reported to be self-sufficient in mobility, over half in the self-help skills, less than half in writing, less than

half were sufficient in expressive and receptive communication, and more than half in socialization. A pie-shaped chart was made in which the professionals broke the population down into the five categories previously discussed. Level "A" (self-sufficiency) included 11%; Level "B" (partially self-sufficient) included 11%; Level "C" (sheltered workshop) was 25%; Level "D" (dependent-living at home) accounted for 22%; and Level "E" (custodial care) was 31%.

RECOMMENDED READINGS

Argyle, Michael. The Social Psychology of Work. New York: Taplinger Publishing Co., 1972.

The Case for Participatory Democracy. New York: Grossman Publishers, Inc., 1971, pp. 73--96.

Franklin, Benjamin. Autobiography of Benjamin Franklin. New York: Macmillan Publishing Co., Inc., 1966.

Kye, Harvey E. Male Survival. New York: Grosset & Dunlap, Inc., 1974.

Report of the California Conference on Rehabilitation. Sacramento: State Department of Rehabilitation, October, 1974, pp. 61--63.

PART VI

Presented by Lavernya K. Carr
Teacher, California School for the Blind

To fully develop eye-hand coordination skills, related skills must be taught at the same time, including:

1. Form Perception and Discrimination -- involved interpretation of information from tactile cues, perception of quantity of number, perception of structural detail.
2. Tactual Discrimination -- ability to interpret sensory information through touch, e.g., temperature, texture.
3. Gross Motor Skills and Fine Motor Skills -- the fine motor is distinguished as those tasks involving much more controlled movements.
4. Laterality/Body Awareness -- knowing where your own body is in space.
5. Directionality -- knowing where objects are in space.
6. Sensory Perception -- ability to perceive symbolic information and use this to make a judgment.

7. Perception of Spatial Relationships -- (1) ability to organize work on paper, e.g., start at the top and work down; start at the left and work to the right; (2) ability to find starting and stopping points; (3) ability to reproduce symbols on paper; (4) understand positions, e.g., over, under, in.
8. Figure-Ground Discrimination -- ability to discriminate background from foreground, and depth perception.
9. Sequence Perception -- ability to understand anything visual, auditory, or manipulative in a certain sequence.
10. Constancy -- doing things in a consistent order.
11. Synthesizing -- assembling separate parts into a whole; being aware of whole from seeing a part or parts; and categorizing.
12. Inferring -- learning to make predictions (conservation, cause, and effect).

Examples of exactly how these terms apply to specific activities were given:

1. Tearing involved gross motor. If a line is drawn to tear along, fine motor is involved.
2. Pasting and gluing involve tactual, sensory perception (tasting), fine motor (gluing within a space), inferring (the amount of glue), and figure ground.
3. Bead stringing involves directionality, inferring, sequencing, and tactual.
4. Cutting involves sequencing, figure ground, form perception, directionality, and fine motor.

An assignment was given for each participant to bring in one hand-eye coordination task, related to the terminology presented. Several participants' projects follow:

PROJECT 1

Terri Gleason, Aide, California School for the Blind

Task:

Implantation of various sized plants into pots of various sizes. (Color matching of flower with correspondingly colored pot -- optional alternative for partially sighted individuals.) The child must judge what size plant is required for certain size pot.

Abilities Employed:

Motor: Gross motor -- picking up pot, manipulating it to fill with soil

Fine Motor -- implanting seedling into soil, digging small hole in preparation

Tactual discrimination: (totally blind) learn shape/size relationship, ascertain when pot is full of soil, depth of implantation

Sequence perception: choose plant and corresponding can to soil to implantation

Directionality: pouring soil into pot without spilling; plant placement (root first)

Figure/ground: focus upon pot and plant

Inferring: pot full of soil -- avoid spillage; eventual growth of plant (?)

PROJECT 2

Brushing Your Teeth

Gina Morgan, Aide, El Sobrante, California

Tactual Discrimination -- feeling of tube with ridges on cap, feeling of brush

Fine Motor -- taking off cap

Laterality -- knowing where your mouth is

Directionality -- use of brush, direction of brushing

Sensory Perception -- taste of toothpaste

Figure Ground -- focus on taking off cap and putting paste on brush

Sequence Perception -- knowing what to do first, knowing the steps

Inferring -- knowing how much paste to put on brush

PROJECT 3

BOAT BUILDING (Nail pounding)

Cherry Champagne, Teacher, Seattle, Washington

MATERIALS: 2 rectangular block wood scraps (shape not important) of different sizes; 1 or 2 long nails, C-clamp; hammer; workbench. Elmer's glue can be used for blind children.

PROCEEDING: The child places the small wood block on the larger wood block and attaches the two blocks to the workbench with the C-clamp. For partially sighted children mark the hole for the nail with black marking pen. For children with more sight loss mark the hole with Elmer's glue (dried ahead of time) or start the nail hole for those with better tactual discrimination. The child is to locate the mark, hold the nail and pound it through both blocks of wood. Voilà, you have a boat. Of course, this activity is useful for making all sorts of thing-a-ma-jigs. And the kids can play with them, paint them or take them apart!

SKILLS INVOLVED IN THIS ACTIVITY:

1. Form Perception is necessary in order to correctly place the small block on top of the larger block and put the nail on the wood instead of vice versa.
2. Tactual Discrimination is especially important for discriminating the head of the nail from the point, the size of the blocks, the raised mark for the nail, the head of the hammer, etc. Of course, the value of this skill increases as usable vision decreases.
3. Motor Skills, specifically, fine motor skills, are required for manipulation of the hammer, a pincer grasp on the nail, stacking the blocks, etc.
4. Directionality occurs when the child must place the wood blocks in a special relationship to one another; i.e., the small block over the large block. To successfully complete the task, the child must move the nail and hammer in a special direction and place them in a special position.
5. Sensory Perception includes the ability to correct the pounding of the hammer when it misses the nail head and the ability to observe when the nail has been successfully hammered in and pounding is no longer necessary.

6. Constancy is discovering that the nail always goes into the wood point first, must be hit directly on the head to ensure success, and must be pounded through both blocks of wood.

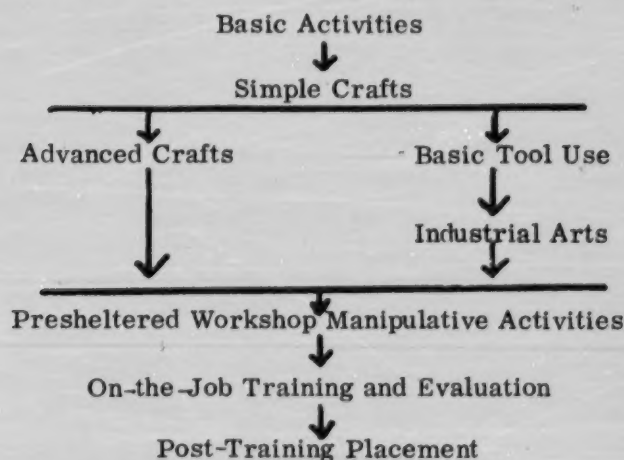
7. Inferring is accomplished through practice and demonstrates that a hammer may be used for pounding and is likely to cause the nail to penetrate the wood. Secondly, a nail, pounded through two blocks of wood, can be predicted to hold the wood together (until someone learns how to remove the nail!).

PART VII

Presented by William J. Evans
Teacher, California School for the Blind

We live in a highly technical industrial society. It is built on the theory of the division of labor and no one person makes all of any mass produced object. Many products of our society have small sub-assemblies. As an assembly job is broken down into smaller and smaller units, there should be some job that can be done by a severely handicapped person.

At the work training class at the California School for the Blind, no attempt is made to train the student for a specific job such as a mechanic or a carpenter. The training class stresses being able to work at a given simulated sub-assembly job for a long period of time. The training jobs are similar to assembly jobs found in sheltered workshops and in industry. The main object is for the student to be cooperative and just stay with the job. If the student is able to do this, he should have a better chance of finding some type of employment.



The chart is somewhat chronological and developmental in nature. It deals with a logical development of manipulative activities.

Basic activities are carried out in the regular classroom setting. Generally, the children at this level are not yet at the point of possessive thinking. The activity normally is not project oriented. This activity only

stresses getting the hands moving and manipulating materials.

Simple crafts are a continuation of basic activities, but they are project-object-oriented. The projects are of a type that the student can recognize as a product of his work. Simple recognizable projects such as collage pictures, paper clip chains and pipe cleaner objects are examples of the projects.

Advanced crafts tend towards more complex objects in a variety of mediums.

Before a child begins basic tool use, he must be alert and interested. As the child becomes more skilled in the use of simple tools he makes a logical transition into industrial arts. In these activities real tools are used in a shop setting and a project is used to provide various learning experiences.

Presheltered workshop manipulative activities are the area of main concern for the low functioning mid-teen youngster. In the workshop training situation there is an emphasis away from the project-oriented activities of the earlier years. These activities helped to develop hand skills. Drawing on these skills the student is put into a simulated work situation where the emphasis is being able to stick to the job. The jobs are not specifically set up in levels of difficulty although some of the jobs are harder and some are easier.

Some of the activities done in the workshop class are folding paper, stapling paper, removing staples, sorting nuts and bolts, sorting desk calendar pages, sewing buttons, punching holes in bottle caps and cracking walnuts.

These activities are designed to simulate a work experience program. Each of the activities is designed to be similar to jobs that are found in sheltered workshops. Mastery of one or all of the activities is by no means a sole indicator of vocational potential.

Criteria for Presheltered Workshop

Manipulative Activities

1. The activity must be safe.
2. The activity must be within the physical and mental ability of the student.
3. There must be a long-term source of very inexpensive materials.

4. The activity must be of a repetitive nature.
5. A useful product is desirable but not an important outcome of the activity.

Goal

The main goal is to make the student more malleable for the next training situation. To achieve this goal, simulated situations provide the students with production-like experiences. Doing the job is the most important aspect of the training experience.

The following handout was distributed to the participants, and they were instructed to write up an activity which met the listed criteria.

Unit Format

Manipulative Activity

Describe what the student is to do.

Task Procedure

Describe how the student will do the task.

Task Objective

Describe the desired outcome of the task.

Potential Use

Describe some practical use of the activity.

Sources of Practice Materials

Describe a source of practice materials.

Criteria

1. The activity must be safe.
2. The activity must be within the physical and mental range of the student.
3. The activity must have a long-range source of inexpensive materials.
4. The activity must be repetitive in nature.
5. If possible, the activity should have some useful product.

Several of the participants' projects have been included:

PROJECT 1

Punching Holes in Paper

Judith Hutchins, Teacher, Yountville, California

Manipulative Activity

The student will punch 3 holes at evenly spaced intervals along the (long) side of a piece of paper. (8 1/2 " x 11").

Task Procedure

1. Determine long side of a piece of paper.
2. Place paper in jig. Line it up correctly.
3. Using a paper punch (hand), punch 3 holes by slipping the paper punch in each of the 3 little "slots" to determine where the paper should be punched.
4. Remove paper and put it in a pile with all the punched sides facing in the same direction.

Task Objective

Student should be able to sit and perform the hole-punching task correctly and continuously for a definite period of time. (30 minutes, 60 minutes).

Potential Use

Following mastery of this activity students may be able to help out in school office punching holes in paper.

At the California Industries for the Blind I noticed many tasks where the person was required to stack his finished part of the product in a certain order so that it could be passed on to the next station. Stacking the punched paper in a certain way would be training for this sort of thing.

Sources of Practice Materials

Scrap and excess paper from Xerox machines, ditto machines, recycling centers, newspaper.

PROJECT 2

Making a Drinking Cup

Iakopo Talau'i, Teacher, American Samoa

Manipulative Activity

How to make a drinking cup from a coconut shell.

Task Procedure

1. Get the copra
2. Cut the copra into two equal parts
3. Take the bottom part and take out the meat with a knife
4. Get some broken glass and separate the outside and inside of this coconut shell
5. Continue this until the outside is shiny as well as the inside and ready to use.

Task Objective

The student will learn how to make a drinking cup from a coconut shell.

Potential Use

The students will learn from this lesson how to make things from some of the objects they find around their environment. Also, they could make cups for their family use.

Sources of Practice Materials

1. Copra can be found everywhere in Samoa
2. Broken glass can be found easily

PROJECT 3

Tangantangan

Judy Boughton, Teacher, Guam

Manipulative Activity

The student is to separate treated Tangantangan pods from a kettle of pods and seeds.

Task Procedure

Seated at a table, the student will reach into the kettle on the table before him. When he comes in contact with a Tangantangan seed pod, he will pull it out and put it into a second container next to the first. He will continue pulling out pods until he can find no more.

Task Objective

The student will persevere -- follow through until he can find no more pods in with the seeds.

Potential Use

On Guam Tangantangan seeds and pods are used to make necklaces. The pods and seeds are first prepared -- cooked, as it were, and separated from each other. The seeds come out in the process and then they are strung. They are made into inexpensive necklaces.

Sources of Practice Materials

The Tangantangan trees are found growing in all parts of Guam. Few materials are required to prepare a batch, which can be mixed and separated many times.

CEREBRAL PALSY, MOTOR DEVELOPMENT, RECREATION AND LEISURE ACTIVITIES

PARTS I - VII

Presented by Michael L. Brown
Physical Therapist, Outland Multihandicapped Center

PART VIII

Presented by Stan Rudger.
Recreation Therapist, Outland Multihandicapped Center

INTRODUCTION

The material I am going to present has been taken from the books listed in my bibliography, mainly from the chapters written by the Bobaths and Mueller in the book Physical Therapy Services in the Developmental Disabilities. I have selected these particular works because of their organization, completeness and quality. Other theories on the management of cerebral palsy are to be found in the same book.

I hope that after this course you will be able to take the books in the bibliography and read them with enough understanding to use them in your programs.

I. Etiology

"Cerebral palsy is the result of brain damage or maldevelopment occurring in utero or in earliest childhood. The lesion (damage) is non-progressive and acts on an immature brain interfering with its normal process of maturation. The term "cerebral palsy" comprises a group of conditions of great variety. With respect to the motor handicap, all cases have in common an impairment of coordination of muscle action with an inability to maintain normal postures and balance and to perform normal movements and skills. Although the most striking deviation from normal is usually seen in the child's motor behavior associated sensory and perceptory disturbances are not rare." (Bobath, 1972)

The etiology or causes of cerebral palsy (C.P.) are varied, including: (1) trauma -- which may result from a high forceps delivery, prolonged labor, rapid labor where the mother is bearing down especially hard or from head injury occurring after birth; (2) anoxia -- (deficiency of oxygen) which might occur because the umbilical cord has a knot or the cord is wrapped around the

neck; (3) hemorrhage -- may be caused by trauma or a disease such as meningitis or encephalitis; (4) toxins -- (poisonous products of bacteria in the body) examples could be tetanus, diphtheria or a condition known as toxemia of pregnancy, which has an unknown etiology and may cause simple or pernicious (fatal) vomiting, acute yellow atrophy of the liver, renal failure or eclampsia (a seizure not of CNS origin); (5) diseases -- such as rubella or encephalitis and meningitis which have already been mentioned; (6) genetic factors; (7) problems associated; (8) isoimmunization reactions -- particularly kernicterus where the mother is Rh- and the baby is Rh+.

In addition to their motor problems, cerebral palsied children frequently have associated problems, such as: hearing, visual, or sensory loss; communications disorders; mental retardation; perceptual problems; and seizures.

The most common hearing disorders in C.P. are high-frequency loss and auditory agnosia. Rubella and kernicterus are two etiological factors in C. P. that also cause damage to the ear.

Strabismus -- nonparallel movement of the eyes -- is the most common visual disorder in C.P. Esotropia is the most frequent form of strabismus. Homonymous hemianopsia is also common. Cataracts are frequent where rubella was the causative factor for the cerebral palsy.

When considering the deaf-blind/C.P. child who must depend, to a large degree, on tactual stimuli for learning, sensory impairments can be devastating. Some common sensory disturbances are: loss or decrease of stereognosis (the ability to discriminate objects by touch), two-point discrimination, position sense, vibration sense, pain and temperature sensation. The children may also be defensive to touch.

Communication disorders can be caused by defects in the articular apparatus such as cleft palate or an overbite. Rhythm disorders and aphasia are also common in cerebral palsied children.

Estimates of mental retardation in cerebral palsy run from 40-70%. I define retardation as delayed development. Bobath and Ayres both feel that movement plays an important role in learning and that any movement disorder can cause delayed development. Perceptual problems resulting from brain damage, such as letter or figure reversal, can be a limiting factor in the intellectual development of the cerebral palsied child.

Seizure disorders, which will be covered in depth later, are common in C.P. children. Again, estimates of the incidence vary, ranging from 14-

75%. In my own experience, approximately 50% of the children have had at least one seizure.

II. Classifications of Cerebral Palsy

Three classifications of cerebral palsy are commonly used. No single classification is totally satisfactory. In describing a child, therefore, one can combine the classification systems.

The first system is based on severity or degree of handicap. Mild cerebral palsy would be when the child needed no treatment, is able to care for himself, ambulates without appliances, and has no speech problems. Moderate cerebral palsy would be when treatment is needed due to self care, ambulation and/or speech difficulties. In severe cerebral palsy the degree of involvement is so great that the prognosis for self-care, ambulation and/or speech is poor.

The topographical system is based upon the areas of the body that are involved. Paraplegia is involvement of the legs only. Hemiplegia is involvement of one side of the body and the opposite side of the face. Triplegia would be involvement of three limbs, usually both legs and an arm. Quadriplegia (tetraplegia) is involvement of all four limbs. Diplegia is sometimes used to describe quadriplegia where the involvement in the arms is less severe than in the legs.

The neuromotor system is based on the type of muscle tone.

The spastic type is characterized by an increase in deep tendons and stretch reflexes. Increased muscle tone, or spasticity, is distributed in typical patterns that can change with changes in position. The majority (approx. 80%) of the cerebral palsied children are spastic. The cerebral cortex is considered to be the site of the lesion when a child is spastic.

The basal ganglion is considered to be the damaged area in the athetoid person. Twelve different athetoid conditions have been described. Athetosis is characterized by sudden, unpredictable and uncontrollable fluctuations in muscle tone which produce excesses of movement. There is an inability to make slow, controlled movements. The body is particularly loose in the hips and shoulders.

The damage in the ataxic person is at the cerebellum. There is a balance impairment which causes a drunken gait. While at rest an interior tremor may be present. The ataxic has low to normal but fluctuating muscle tone. The ataxic does not have the excess movement exhibited by the athetoid person.

In the rigid type of cerebral palsy there is continuous resistance of agonist and antagonist muscles to movement. The rigid type is very similar to the spastic except that the deep tendon reflexes are normal and tone doesn't change with changes in position. The site of the lesion is the middle lobe of the cerebellum.

Because brain damage is not always limited to one area of the brain, combinations of the above types of cerebral palsy are common.

III. Neurophysiological Basis of Motor Development

By presenting the neurophysiological basis for motor development I hope to accomplish two things. Traditionally teachers are exposed only to functional norms and not the underlying neurological mechanisms that make achievement of these norms possible. So my first goal is to expose you to this view of motor development and the terminology that is used in the literature when discussing it. Secondly, by understanding the normal sequence of postural reflex development you will have an idea of why a cerebral palsied child develops as he does.

Some basic concepts of brain function are necessary to understanding neurophysiological development. Nervous centers represent movements not muscles. This is why when the brain is damaged one does not have paralysis of individual muscles, one has disruption of coordinated movement. Adaptive postural changes precede and accompany each movement. All of our movements require constant changes of posture and the maintenance of equilibrium in constantly changing conditions. Finally, voluntary movements are based upon the automatic (primitive) patterns of earliest childhood.

"The development of normal motor abilities is essentially characterized by two features: (1) The development, in a definite sequence of events of a normal postural reflex mechanism, that is righting, equilibrium and other protective reactions associated with normal postural tone; (2) The increase of inhibition of the maturing brain leading to a gradual breaking up and re-synthesis of early total synergies (patterns) of muscular coordination in many and varied ways to allow for discreet and selective movements later on." (Bobath, 1972)

The righting reactions are the first reactions to come into play in the growing baby. They develop from birth on, have maximal effect around 10-12 months, are gradually modified and disappear by the end of the fifth year. As can be seen in the Reflexes and Reactions Chart, the neck-righting reaction (1 phase) is present from birth to approximately 6 months. In response to the stimulus of turning the head to the side the child's body will then roll to that side to restore normal body alignment. It should be noted that there is no

REFLEXES AND REACTIONS CHART

REACTION OR REFLEX	STIMULUS	RECEPTOR	AREA OF INTEGRATION	MOTOR RESPONSE	TIME PRESENT
Flexor Withdrawal Reflex	Pinprick to sole of foot	Pain receptors of foot (S1, S2)	Spinal Cord	Withdrawal of leg by simultaneous flexion of ankle, knee, and hip	Birth to 3 mos.
Crossed Extension Reflex	Firm pressure applied to plantar surface of foot while leg is maintained in extension	Exteroceptors and pressure receptors (S1, S2)	Spinal Cord	Flexion of unstimulated leg, followed by extension with slight adductions. Stimulated leg held in extension	Birth to 1-2 mos.
Support Reaction (Primary Standing)	Weight or touch on balls of feet as infant is held erect	1. Proprioceptors - muscle spindles of foot, intrinsic or joint receptors 2. Exteroceptors	Medulla	1. Hips & knees extended bilaterally (with some adduction) and infant's legs are able to support weight 2. No balance involved	Birth to 2-3 mos., disappearing prior to voluntary standing or may persist until voluntary standing achieved
Positive Support Reaction	Weight or touch on balls of feet as infant is held erect	1. Proprioceptors-- muscle spindles of foot, intrinsic or joint receptors	Medulla	1. Cocontraction of flexion and extension 2. No balance involved	
Plantar Grasp	Touch and pressure on plantar surface of sole of foot, just behind toes	1. Proprioceptors-- muscle spindles of toe flexion, or joint receptors 2. Exteroceptors	Spinal Cord	Flexion of all toes	Birth to 8-10 mos. Usually gone when walking
Moro Reflex	Dropping baby's head backward about 30° in relation to trunk	Proprioceptors of neck muscles & joints of cervical vertebrae may be labyrinths		Abduction and extension of arms with hands open. Followed by adduction of arms as if to embrace. Should have symmetrical response	Birth to 4-6 mos.

REFLEXES AND REACTIONS CHART (CONT.)

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REACTION OR REFLEX	STIMULUS	RECEPTOR	AREA OF INTEGRATION	MOTOR RESPONSE	TIME PRESENT
Startle Reaction	Sudden loud noise, bright light, tapping of sternum, etc.			Flexion of upper limbs. Elbows flex and hand remains closed. May include blinking.	Persists throughout life
Palmar Grasp	Tactile stimulation first across palm of hand.			Flexion of all fingers. Thumb may flex across palm. Should have symmetrical strength	Birth - 3 mos.
Tonic Neck	Position of hand in relation to trunk persists if left in position - latent period between stimulation and response	Proprioceptors of cervical muscles (C1,2,3) with some contribution from joint receptors	Reticular Formation (medulla)		
Asymmetrical (ATNR)	Rotation of head to one side May set off response either passive or active (stronger active)			Extension of limbs to which the face is turned; flexion of occipital limbs	Birth - 4 mos. is normal up to 4 mos. Will not always happen; not obligatory; abnormal if obligatory
Symmetrical (STNR)	Neck flexion Neck extension			Flexion of arms; extension of legs and hips Extension of arms; flexion of legs and hips	2-6 mos. After 6 mos. abnormal 137
Tonic Labyrinthine Reflexes	Position of head in space Supine Prone	Otolith (probably utricular portion) Persists as long as is maintained	Reticular Formation (medulla)	Extend pattern-supine Flex pattern-prone Maximal extension tone (supine) Minimal extension tone (prone)	Not clearly demonstrated in healthy infants; common to have both; may have extension or flexion

REFLEXES AND REACTIONS CHART (CONT.)

REACTION OR REFLEX	STIMULUS	RECEPTOR	AREA OF INTEGRATION	MOTOR RESPONSE	TIME PRESENT
Righting Reactions					
1. Labyrinthine righting of head	Positioning of head out of normal position in space	Otoliths of labyrinth	Midbrain	Head assumes normal position in relation to gravity.	Beginning by 2 mos. - throughout life
2. Optical righting	Visual cues	Eyes	Occipital Cortex	Head assumes normal position in space.	6 mos. ? - through life.
3. Neck righting (one phase)	Rotation of neck with infant supine & shoulders unrestrained.	Proprioceptors or neck muscles or joints	Pons	Rotation of body as a whole toward the side to which the head is turned. No rotation between pelvis and shoulders.	Birth 4-6 mos.
4. Body righting acting on body or Neck Righting (two phases)	Rotation of pelvis or shoulders in relation to rest of body (asymmetrical stimulation of body surface)	Exteroceptors and proprioceptors of trunk	Midbrain	Segmental rotation of body to restore <u>normal body alignment and position in space.</u>	6 mos. - to be gradually modified until 4-5 years
Landau (Symmetrical Chain Reaction in Abdominal Position)	Child suspended in prone position. Held on lower portion of chest. (When head passively flexed)			Head is raised and trunk and hips are extended. Extension tone of trunk and hips is inhibited (flexion).	5 mos. - 2 yrs.
Downward Parachute Reaction of the Legs	Child is rapidly lowered toward the ground in an erect position			Lower limb extension, abduction, and external rotation. Fanning of toes and extension of big toe may be noted while in air.	5 mos. onward
Protective Extension (Parachute Reaction of Arms of "Sprung bereitschaft" -- Readiness to jump)	Child suspended in prone position and lowered suddenly downward toward surface			Upper limbs extended with slight abduction at shoulders and spreading of extended fingers. Should be symmetrical.	6-12 mos. persisting throughout life

REFLEXES AND REACTIONS CHART (CONT.)

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REACTION OR REFLEX	STIMULUS	RECEPTOR	AREA OF INTEGRATION	MOTOR RESPONSE	TIME PRESENT
Amphibian Reaction	Elevation of pelvis on one side as child lies prone with arms and legs extended			Flexion of arm, hip, and knee on the same side.	6 mos.
Automatic (Primary) Walking.	Trunk supported, place feet on table. Child's legs extend and assume standing. Tilt forward slightly.			Well coordinated; rhythmical steps; hips and knees do not fully extend.	Birth - 1 mo. Must disappear before voluntary walking can be achieved.

rotation within the body axis. The labyrinthine righting of the head allows the head to assume normal position in relation to gravity. It is this reaction that is necessary for the child to lift his head when in prone and supine positions. The body-righting reaction acting on the head interacts with the labyrinthine righting reaction to secure the position of the head in space. The body-righting reaction acting on the body (neck righting 2 phase) allows the child to roll segmentally in leading with head, then shoulders and then hips. The optical righting reaction is the main factor of the adult for maintaining the position of the head and normal alignment of the body and parts.

The righting reactions secure the normal position of the head in space (face vertical, mouth horizontal) and secure the normal alignment of head, neck, trunk and limbs. They guide the child's motor activities throughout the quadrupedal stage. You can see righting (body on body) in the way a child gets up from supine, rolls to prone, and gets up using hands and knees. As righting reactions are inhibited the child will sit up and stand in the symmetrical adult pattern.

The equilibrium reactions remain with us throughout life and serve to adjust posture and maintain or regain equilibrium. They first appear in prone, at approximately 6 months, in response to tipping. The child will bend his head and arch his body toward the raised edge of the table; the arms and legs on the raised side abduct and hips may rotate to the lower side. The reactions appear in supine shortly after prone and there is sitting, kneeling and standing.

Some other reactions of significance are: the moro reflex, landau reaction, protective extension, plantar and palmar grasp, primary standing and automatic walking. The functional significance of the moro reflex is not known. The landau reaction possibly prepares the child for stability in standing. Protective extension (propping) appears in sitting first to the front, then to the side and finally to the rear. The grasp reflexes may persist in the cerebral palsied child interfering with gait and the release of objects held in the hand. Primary standing and automatic walking must be inhibited before true standing and walking can occur. They should not be mistakenly encouraged in the cerebral palsied child as they often are.

I have not covered all of the reflexes listed on the chart. Nor have I covered all of those that have been identified. For further information, refer to Chapter 5 in Illingworth.

IV. Neurological Considerations in Cerebral Palsy

"In cerebral palsy the lesion interferes with orderly neuromotor development. Essentially this will result in two symptoms as follows:

1. Symptoms of arrest or retardation of motor development. These are seen in an insufficiently developed postural reflex mechanism, resulting in poor head control, lack of rotation within the body axis and poor equilibrium. This can be seen in the retention of primitive kicking, of grasp reflex, the moro reaction (usually in the modified form of the second stage), of neck righting reaction or primary walking and galant reflex among others.
2. Abnormal symptoms, that is signs of a release of abnormal postural reflexes, the tonic or static reflexes of Magnus (1926) and Walshe (1923). They produce abnormal patterns of coordination in association with abnormal postural tone." (Bobath, 1972).

The tonic labyrinthine reflex has not been clearly demonstrated in healthy infants and should probably be considered abnormal whenever it is seen. When in the supine position, the reflex causes maximal extension tone throughout the body. In the cerebral palsied child this will cause the head, neck and shoulders to press back into the supporting surface. The arms will abduct and flex at the elbows. The legs will extend and adduct, perhaps even cross. Under the influence of this reflex the child is not able to raise his head, bring his shoulders forward so that he can pull to sitting, flex his hips to allow sitting, bring hands together in the midline in order to explore his own body or manipulate objects. When in the prone position maximal flexion tone would be present. This flexion tone would interfere with functional activities in prone. In severe cases the extension tone persists even when in the prone position.

The asymmetrical tonic neck reflex (ATNR) is found in normal children. However, it is abnormal whenever it is obligatory. Usually stronger to one side, the ATNR can produce a scoliosis and tilting of the pelvis. It can interfere with grasping of an object while looking at it, from bringing the hands to face and body and can, due to fixation of the eyes to the side to which the head is turned, prevent tracking across the midline.

The stimulus for the symmetrical tonic neck reflex (STNR) is the position of the head in relation to the body. The effects of the STNR can greatly interfere with activities in the quadrupedal position.

The positive support reaction is stimulated by weight or touch on the balls of the feet causing a cocontraction of the flexor and extensor muscles in the lower limbs. This reflex can greatly interfere with ambulation as the reflex is stimulated each time the foot contacts the supporting surface.

Finally, associated reactions can occur whenever the child uses too much effort in performing an activity. A general increase in hypertonus occurs

throughout the body.

The Developmental Achievements Chart shows the normal evolution of reflexes and reactions from approximately 4 to 15 months. It also describes the abnormalities that may hinder this evolution of reflexes and prevent the child from achieving developmental milestones. This chart can be used to aid in determining problems and for planning a child's individual program.

V. Management of Cerebral Palsy

Although every child is different there are a few general rules, mainly common sense, that can be applied to the management of cerebral palsied children.

A spastic cerebral palsied child usually has a restricted range of motion (R.O.M.) due to the spasticity (increased muscle tone). This restriction of R.O.M., which is usually very noticeable in the shoulders, elbows, hips, knees and ankles, can lead to permanent fixed deformities (contractures and dislocations). You can help to prevent deformities by assisting the child to change its position frequently, by avoiding positions such as the reversed tailor (w position), and by limiting the amount of time a child spends in supine or sitting in a wheel chair. Alternative positions are side lying, prone on a puppy or prone board or a wedge cushion, and in a quadrupedal position straddling a roll. Sitting may be done in ring or long sitting and a triangle (corner) chair may help to maintain sitting balance.

Movement should be encouraged, especially for those with large ranges of motion. Swimming is an ideal form of movement when done in warm (86° minimum) water.

Because of its slowness of movement and possible lack of protective and equilibrium reactions, a spastic child should be moved slowly and given the opportunity and time to make the necessary postural adjustments. Fast movements, excitement and exertion can all cause increases in muscle tone and should be avoided. Care should be taken not to stimulate any of the abnormal reflexes such as positive support or tonic labyrinthine while handling the child. An example of this would be putting your hand on the back of a child's head while trying to pick him up from supine, thus stimulating the tonic labyrinthine reflex.

Both ataxic and athetoid individuals suffer from fluctuations of and a decrease in muscle tone. The athetoid person has too much movement, much of which is uncontrollable. Support or stabilization at proximal joints may help to

DEVELOPMENTAL ACHIEVEMENTS CHART

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Developmental Achievements

Normal Evolution of Reflexes and Reactions

Abnormalities of Tone/Movement Patterns Which May Interfere

4-5 MONTHS

Supine

1. Head in midline

a. Dissolution of ATNR

a. Persistent ATNR

b. Asymmetry of tone as in hemiplegia

2. Hands to midline and grasps object bilaterally

a. Palmar grasp reflex diminishing

a. Persistent ATNR

b. Persistent palmar grasp

c. Tonic labyrinthine reflex

d. Deficient vision or lack of interest

3. Eyes follow 180° (from 3 mo.)

Sitting

1. Head well controlled when supported at trunk, and head in line with trunk when pulled to sitting

a. Labyrinthine and optical righting of head developing

b. Moro reflex disappearing

a. Persistent ATNR

b. Hypotonia

Prone

1. Supports on forearms (with free kicking of legs)

a. Landau developing (head above horizontal)

a. Hypotonia

b. Tonic labyrinthine reflex

6 MONTHS

Prone

1. Frees arm to reach for object

a. Equilibrium reactions developing (prone)

a. Tonic labyrinthine reflex

b. Hypotonia

2. Rolls prone to supine and supine to prone (voluntarily)

a. Neck-righting reflex being modified by body-righting reaction on the body

a. Persistent neck-righting reflex

b. Tonic labyrinthine reflex

c. Persistent ATNR

DEVELOPMENTAL ACHIEVEMENTS CHART (CONT.)

Developmental Achievements	Normal Evolution of Reflexes and Reactions	Abnormalities of Tone/Movement Patterns Which May Interfere
6 MONTHS (cont.)		
<u>Sitting</u>		
1. Assists in pull to sit	a. Equilibrium and labyrinthine righting reactions developing	a. Tonic labyrinthine reflex b. Hypotonia
2. Sits with arms forward	a. Labyrinthine righting of head b. Propping reactions of arms developing (forward)	a. Tonic labyrinthine reflex or extensor pattern of trunk and lower limbs
<u>Standing</u>		
1. Supports large fraction of weight and bounces	a. Normal supporting reaction developing b. Parachute reaction of legs developing	a. Abnormal positive support reaction b. Primitive stepping reflex
<u>Eye-Hand</u>		
1. Grasps object unilaterally and brings object to mouth (feeds self cracker)		a. ATNR b. Tonic labyrinthine reflex
2. Transfers object		a. Asymmetry of tone and function as in hemiplegia
7-9 MONTHS		
<u>Prone</u>		
1. Prone progression--pivoting, crawling, creeping	a. Equilibrium reactions developing (prone and quadruped)	a. Tonic labyrinthine reflex b. Symmetrical tonic neck reflex
<u>Sitting</u>		
1. Sits without support (8 mo.,)	a. Propping reactions (laterally) b. Equilibrium reactions developing (sitting) c. Landau (continued development of trunk extension)	a. Hypotonia b. Extensor or flexor hypertonia (preventing normal sitting posture)
2. Assumes sitting position	a. Body-righting reaction on the body	

DEVELOPMENTAL ACHIEVEMENTS CHART (CONT.)

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Developmental Achievements	Normal Evolution of Reflexes and Reactions	Abnormalities of Tone/Movement Patterns Which May Interfere
<u>10-12 MONTHS</u>		
<u>Sitting</u>		
1. Sits with freedom to use hands, rotate trunk and pivot in position	a. Equilibrium reactions being perfected (sitting) b. Propping reactions (backward)	a. Abnormalities of tone (in abnormal patterns)
<u>Standing</u>		
1. Pulls to standing and walks along furniture	a. Landau (trunk and leg extension complete) b. Lateral protective extension reaction of legs c. Equilibrium reactions (standing)	a. Abnormalities of tone including hypotonia and flexor or extensor hypertonia (positive support reaction)
<u>Eye-Hand</u>		
1. Pincer grasp	a. Has gained postural control of upper limbs	a. Spastic or dystonic patterns of upper limbs b. Athetoid or ataxic movements c. Intention tremor
<u>13-15 MONTHS</u>		
<u>Standing</u>		
1. Stands alone and takes first steps	a. Equilibrium reactions (standing)	a. Abnormalities of tone in abnormal patterns including hypotonia with ataxia; positive support reaction
2. Assumes standing	a. Body-righting reaction on body and equilibrium reactions	

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control purposeful movements. In the classroom, the size of movements can be limited by task placement. Balance activities in a safe environment can be beneficial.

Many ideas for handling and supporting the cerebral palsied child can be obtained from the Finnie book that is listed in the bibliography.

VI. Feeding

The feeding technique that I will discuss was developed by Helen Müller. She has written a chapter in the book Physical Therapy Services in Developmental Disabilities.

As with the body, there are oral reflexes that must be dealt with when discussing feeding problems. The first is the rooting reflex. This is turning toward a stimulus (touch) on the cheek. This is a basic reflex that aids the child in finding the nipple in order to feed. The sucking and swallowing reflex comes prior to true sucking and swallowing. When this reflex is not inhibited in the course of development, a tongue thrust and clicking of the soft palate can develop. The bite reflex can be stimulated by any stimulus to the mouth. This reflex is still active in those children who bite the spoon during feeding. The gag reflex is stimulated normally by touching the back half of the tongue or soft palate. In cerebral palsied children this reflex may be stimulated by stimulus to the front portion of the tongue, or in extreme cases, by just moving an object toward the mouth. I think that it is apparent how these reflexes would interfere with a child's feeding.

Problems of muscle tone occur in the mouth of the cerebral palsied child just as they do in the limbs. Spasticity is easily felt in the cheeks and lack of coordinated movement of the tongue interferes not only with feeding but also with speech.

Oral tactile sensitivity is common. In severe cases total body patterns can be set off by oral stimulation.

Deformities such as cleft palate and overbites contribute to feeding difficulties.

Müller recommends four positions for feeding the cerebral palsied child. The first is lying supine on a pillow, facing the adult in the adult's lap. The head should rest against the table edge so that the head is slightly flexed. Scissoring of the legs is prevented by the adult's trunk. The arms are brought forward. The second feeding position is with the child in the adult's

lap such that the baby's hips and knees are flexed at least 90°. The adult's arm should go behind the baby's back to hold the shoulders forward and to provide jaw control. Care should be taken not to stimulate a total extension pattern by touching the back of the head. The degree of flexion at the hips and knees can be increased to help control a severe extension pattern. The third position is with the child sitting in a chair with hips and knees well flexed. Riding a sawhorse or barrel, rather than a chair, can help to break up the total extensor/flexor pattern by abduction and external rotation of the legs. Breaking the total pattern can facilitate head and trunk control. The fourth position is prone and is used only for severe sucking-swallowing and retrusion of the mandible. The child can be placed on a prone board.

Jaw control, if required, is applied from the beginning of the meal until it is finished. For this reason planning for and arranging all necessary items before the meal begins is a must. To apply jaw control from the front (i.e., when child is in position one) the middle finger is placed under the chin and pressed against the base of the tongue to control tongue thrust. The index finger is placed on the side of the jaw to regulate horizontal motion and the thumb is placed on the chin just below the lower lip to control opening and to initiate the rotary motion of chewing. The thumb and index finger swap positions when using the arm behind the back (position two) for jaw control.

To normalize oral-tactile sensitivity the jaws are held closed and in symmetry. The outer gums on one side are rubbed with a few (approx. 3) firm strokes, gradually reducing the firmness. This stimulation will cause saliva production. To get the child to swallow, maintain jaw control while holding the upper lip closed with a finger from the free hand and wait for a swallow. This procedure is repeated on the other side and on the inside of the gums and the hard palate. Finally the tongue should be stroked firmly front to back. The child should swallow after each area is stimulated.

When spoon feeding, press the bowl of the spoon firmly on the tongue and wait for the child to pull the food off of the spoon with his upper lip. Do not rake the food off on the upper teeth as you withdraw the spoon.

A substitute for food when trying to elicit chewing is gauze dipped in honey. Finger foods cut into long strips (cheese, cooked vegetables, bread) are good foods for a child just beginning to chew. The food should be placed on the molars when a child has a tongue thrust that would push the food out. Food can also be placed to the side or back of the mouth when a child has an overbite and can't bite food off with his front teeth.

VII. Epilepsy

"Epilepsy (seizures) is characterized by sudden, transient alterations of brain function, usually with motor, sensory, autonomic and psychic symptoms and often accompanied by alterations in consciousness." (Chusid and McDonald).

Seizures may be caused by organic brain disease (CVA, tumor), metabolic disorders (uremia, hypoglycemia) or by childhood causes (anoxia, brain damage, maldevelopment).

Many different stimuli can trigger a seizure; the following is a list of common ones: light, sound, touch, excess alcohol, fatigue, emotional tension, lack of food, lack of sleep, spinning and swinging.

One type of seizure is the grand mal seizure which usually involves loss of consciousness. The person will fall to the floor and the body will stiffen for one or two minutes, followed by rhythmical contractions in the body movements. Frequently there is a loss of bowel and bladder control. Biting injuries to the tongue are common. After the seizure the person will want to sleep one to four hours.

The petit mal seizure is very transient, and could occur one hundred times a day without the individual even noticing. Jacksonian seizures are due to an irritation in the motor cortex, which cause seizures with a motor component. This could be a small jerk or it could have total body involvement. Psychomotor seizures are those seizures that do not fit into any other category. Some of these appear to be a purposeful movement.

Status epilepticus, which could be fatal, is a train of severe seizures which occur at ten to thirty second intervals or there may be no noticeable interval. The person may need an intravenous injection to stop the seizure. A good rule of thumb is to take the person to the hospital if the seizure lasts more than ten minutes.

One should watch the child's seizure pattern and try to become aware of those activities which trigger them, so as to avoid setting one off. Sometimes there is an aura that precedes the seizure which warns you that it is about to begin. Get the child down on the floor, clear the area and protect his head. Do not attempt to restrain him, as he could jerk in such a way that a bone would break if not allowed free movement. Turn his head to the side to stop him from swallowing his tongue or choking on saliva. However, do not forcefully hold the head. If there is a lot of head movement, try to protect it. Once he is asleep, you can turn his head to the side. Do not put anything between his teeth. Allow him to sleep as long as he wants to. You

should be aware that emotional tension could set off another seizure, so treat him as naturally as possible when he awakens. Do not say anything which will embarrass him -- particularly avoid mentioning loss of bladder control.

VIII. Recreation and Leisure Activities

The subject of motor development has been analyzed and defined from a variety of interdisciplinary positions ranging from perceptual motor parameters to sensorimotor or kinesthetic considerations. Motor development, however, by its nature, cannot be defined succinctly in terms of any single discipline -- rather, it inculcates a subtle homeostatic functioning of both physiological and neurological factors. For our purposes, it is better to define the subject of motor development from this more collective basis as being a synthesis of the total processes by which an individual gains motor and cortical control over his body functions. It is not within the range or scope of this paper to present a complete compendium on the subject of motor development -- interested readers are referred rather to the writings of Arnold L. Gesell and Robert Malina. There are, however, several prerequisite principles of motor development which should be of interest to any individual concerned with the motor function of the handicapped child. An understanding of these basic principles of development can be of pragmatic value in assessing and evaluating a child's motor competencies and patterns of growth. Such knowledge, obviously, can be utilized in planning experiences which are meaningful and appropriate for the child.

Research indicates that motor development is predictable, sequential and observable. Essentially, it proceeds in a directional manner in terms of both growth and function. The directional sequence of motor development is best described as first occurring in a cephalocaudal or superior-to-inferior direction and secondly, in a proximodistal manner or from the center line of the body to the periphery. These directional patterns are most easily observed in the pre-natal development of the embryo and fetus; i.e., the most rapidly differentiating cells in the embryo are those formed along the frontal and sagittal axis of the embryonic spine from the head to the tail. The embryonic head forms initially; then, the development of arm and leg buds, respectively. Neurological development reflects this same sequential trend and is observable in that control of the head and cervical muscles precedes that of the trunk and limb segments. It is generally accepted that the majority of early post-natal patterns of motor development are based upon maturation. The maturation process involves sequential changes in function and form which result from innate rather than environmental influences; thus, those characteristics which are subject to maturation are relatively predictable in a normal population. There are,

however, a variety of motor developmental characteristics of behaviors which do not reflect phylogenetic (innate) responses. These learned or acquired behaviors (ontogenetic behavior -- i.e., swimming, riding, etc.) are less predictable than phylogenetic motor development. This distinction is important in planning realistic, developmentally sound motor programs for the handicapped -- generally, phylogenetic-oriented activities should precede ontogenetic activities. The motor development sequence basically remains the same even in the handicapped child; however, there may be apparent delays or aspects of development which are totally absent. It is possible to remediate selected motor development dysfunction through kinesiological well-planned activities. These activities need not be restricted solely to therapeutic methodologies of physical or occupational therapy.

Many different recreational activities can be used as valuable adjuncts to physical or occupational therapies. In planning these meaningful recreational activities for any group of handicapped individuals it is essential that a basic understanding of the motor development sequence and a realistic evaluation of the individual's needs in relation to his pathology be the requisite factors for selection. Recreational activities for the handicapped need not and should not be solely restricted to the psychosocial domain of passive activity. Well-planned, dynamic activities can be employed to facilitate these same ends, but with the additional benefit of improving the motor function of the individual. There are a variety of recreational programs and approaches ostensibly designed to provide for the physical needs of the handicapped individual -- few, however, actually reflect sound developmental or kinesiological foundations.

It is not within the physical limitations of this abstract to present even a terse critique of all of the existing recreational program approaches and activities which have been directed toward the needs of the handicapped child. Rather, to reiterate, the reader is reminded to analyze a potential activity or program first from a motor developmental or kinesiological basis and secondly, from psychological or social considerations. Adequate programs or activities should answer the following questions affirmatively -- does the activity or program inculcate motor patterns which reinforce sound motor developmental concepts -- is the activity appropriate to the child's motor competencies and needs -- can it be manipulated or adapted to augment existing therapeutic objectives? There are a number of activities and approaches which do reflect these developmental concepts. Two particularly useful approaches are represented in the Development Through Action series, created by Bryant Cratty for the Skill Development Equipment Company (S.D.E.), located in Anaheim, California, and the modernization and unification of the early 20th century German and English concepts of "movement exploration."

The latter approach to activity is based upon the philosophy that motor development is dependent upon a variety of motor experiences involving exploration of all possible motor patterns. Movement is its key element and is the medium through which a child seeks a motor solution to a specific motor problem. The solution to the "problem" or superficial objective generally inculcates a specific motor development pattern of activity; i.e., can you move from here (designate area) to there (again indicate specific area) using only your knees and hands -- the facilitation of a quadrupedal crawl or creep is obviously the primary motor development objective. There are, however, no clearly defined or stated solutions; each child analyzes the problem and seeks a solution within the limitations of his or her own abilities.

Movement exploration, as an alternative approach to recreative activities or physical education programs, has been successfully used with normal children at the primary and intermediate levels for at least a decade. However, it is a relatively recent innovation in relation to its uses with handicapped populations. It has been used with graded success with mentally retarded, cerebral palsied and deaf-blind populations at a variety of institutions, in particular the Richard Outland Multihandicapped School, Saratoga, California. The success of movement exploration as a program modality is primarily dependent upon communication -- the phrasing of the question and the child's subsequent interpretation and motor responses. In this respect some difficulty has been encountered in its application to deaf-blind children. One approach or solution to the problem of limited communication is in structuring a physical environment to elicit specific motor responses. The "problem" then becomes a tactile kinesthetic one more suited to the sensory environment of the deaf-blind, but still one requiring individual analysis and resolution. The concept of movement exploration is not presented here as an in-depth or clearly defined approach to facilitating motor development for handicapped children, it is rather presented to illustrate its potential in terms of its adaptability, experiential range and motivational dynamics -- a more comprehensive and pragmatic treatment of the movement exploration concept can be found in the writings of Layne Hackett and Robert Jenson.

The Development Through Action series, like the movement exploration concept, incorporates sound motor developmental elements; however, it is primarily organized around the physical manipulation of the child's environment to stimulate specific motor responses and postural adjustments. A major aspect of the program is the proper utilization of a variety of uniquely designed geometrical shapes and surfaces produced by S. D. E. Company. The majority of this equipment is constructed of foam and vinyl-coated nylon. Typically, severely handicapped children, such as the deaf-

blind child or cerebral palsied child, exhibit pronounced withdrawal or avoidance reactions as they are placed in situations requiring dynamic postural adaptations. A primary contributing factor to this withdrawal reaction is an exaggerated fear of injury. The soft, giving surfaces offered by S.D.E. serve to reduce this fear and to encourage motor exploration. The geometric variety of these apparatus also permits considerable latitude in planning novel motor developmental and therapeutic activities.

It should be reemphasized that the movement exploration concept and the Development Through Action Program represent only two approaches to facilitating motor development in handicapped children. In addition to a variety of other program approaches, there are a number of recreative activities which reflect sound kinesiological elements and which can be directed toward the developmental needs of the disabled child. The remainder of this paper will be directed to briefly outlining four particularly adaptable and useful activities. The first three activities presented are apparatus oriented, involving the scooter board, trampoline, and lind climber. The fourth activity reflects a unique approach to swimming.

The Scooter Board

The scooter board has been used as a therapeutic apparatus for many years to develop kinesthetic responses, increase range of motion, strength, mobility and balance. In addition, it functions to encourage independence and socialization in children who are not fully ambulatory for pathological or developmental reasons (i.e., cerebral palsied child or functionally retarded deaf-blind child). The child is introduced to the scooter board in a prone position -- this position functions to reduce the child's anxiety and to facilitate his physical manipulation. In addition, the prone position encourages the reduction of atypical reflex patternings that cerebral palsied children typically exhibit. The general scooter board management sequence is passive motion (instructor-provided impetus), assistive manipulation, active-assistive and finally active or independent participation. In employing the scooter board as a mobility activity for cerebral palsied children manipulation must be specific to the particular clinical type of cerebral palsy the child manifests; i.e., spastic, athetoid rigid, etc. When, for example, a spastic C.P. is placed on the scooter board, if he is quadriplegic or his C.P. involves the upper limbs, his arms should be "shaken" out to facilitate extension and eventual flexion. The instructor should also fixate the child's wrists while in extension -- in this manner the child can exert a natural "pulling" contraction and be patterned at the same time. In contrast, the athetoid C.P.'s (choreo-athetoid) uncontrolled worm-like motions require that his limb segments be fixated at the most proximal

joint segment, thus fostering controlled motor responses.

Once the child has experienced active or independent participation on the scooter board in the prone position, he should progress, his disability permitting, to a sitting and thence to a kneeling position. The seated position on the scooter board reduces mobility; however, it serves to increase range of motion and improve dynamic balance. Whether the C.P. child utilizes his hip extensors or flexors to provide mobility in a seated position on the scooter board is dependent upon his specific C.P. classification. Generally, the spastic C.P. exhibits atypical hip flexion and thus should be encouraged to use his hip extensors as prime movers. The athetoid, however, should be encouraged to move in opposition to extension -- to utilize his hip flexors. To achieve this end, it may be necessary to fixate or support the athetoid child at the hip; this stabilizes and encourages proper sequential muscular contractions.

The scooter board can be utilized to stimulate the residual sensory and kinesthetic functions of children with major sensory deprivations; i.e., the deaf-blind child. Rotary movement, for example, while in a seated position on the scooter board, functions to stimulate the vestibular system, requiring a number of adaptive kinesthetic responses to the centrifugal and gravitational forces of the motion, in order to maintain a vertical seated posture.

Socialization and coactive play are important aspects of any recreation program or activity -- this is particularly true for the handicapped child who because of his disability may be deprived of the normal social experiences of other children. These less tangible elements of recreative activities can also be encouraged through the creative utilization of scooter boards. By arranging the boards in specific configurations (i.e., circles, lines, etc.) the marginally ambulatory or functionally retarded child is able to participate in a variety of group activities or games such as ring-around-the-rosy or soccer. Independent movement can be encouraged through the use of various sensory stimulators (i.e., light, sound, edible reinforcements).

The Trampoline

The trampoline is both a recreational and therapeutic device. It has been used clinically to assess and evaluate gross coordination, postural adjustments and dynamic balance of neurologically and visually impaired children. As a therapeutic modality it functions to facilitate dynamic balance, timing, rhythm, directional concepts, body awareness and muscular strength. It should be emphasized, however, that as a viable activity for cerebral

palsied children, the trampoline is generally contraindicated. The rapid muscular contractions required of this activity create excessive excitation in the muscle spindles of the cerebral palsied child and result in painful spastic contractions.

Prior to actually mounting the apparatus, a "pre-trampoline" program of activity involving strengthening and stretching movements should be pursued. Similarly, specific trampoline movements such as the knee drop and seat drop should be performed on a port-a-pit or air-flow mat to facilitate proper motor patterning and reduce anxiety.

Of primary concern in establishing a realistic trampoline program for handicapped children are safety procedures and precautions. In this regard, devices such as trampoline bumpers or frame pads must be utilized, and spotters must be positioned at each end of the apparatus and instructed in proper protective postures. Additionally, some manner of marking must be placed at the center of the trampoline surface to guide the child's movement -- all activities and stunts are executed at the center of the trampoline. Visually handicapped children must be provided with some form of auditory or tactile cuing device (i.e., "beep" tone). If possible the visually impaired child should also be conditioned to respond to specific tactile or verbal cues from the instructor.

Controlled movement must be stressed in conjunction with proper body mechanics at all times. Specific motor patterns can be facilitated by physical manipulation by two instructors -- one on the surface of the trampoline with the child and the other at ground level. Upper extremity involvement should initiate a circular pattern of motion and be used to maintain balance and increase force.

The trampoline, by its nature, is a potentially hazardous piece of equipment, but it can be used successfully and safely if a realistic developmental program of activities is adhered to. Such a program must be graded, beginning with kinesiologically and developmentally sound familiarization activities, then progressing to greater gross motor or body involvement and finally to a highly disciplined stunt phase. In teaching advanced activities or stunts such as the front drop, it must be emphasized that the child not dive forward, but rather upward and in a controlled, slightly piked posture. This position will result in the child's thighs, abdomen, forearms and hands striking the trampoline bed or surface simultaneously. There are a variety of commercially prepared trampoline programs; few, however, provide for the physical or psychological needs of the handicapped child. Of primary importance is the inclusion of a realistic familiarization or precursor phase. An adequate familiarization phase should reflect, in approximately the same

sequential or developmental order, the following twenty-two performance items:

Familiarization phase - part one

1. Creeps or crawls on and around the trampoline
2. Executes sideward rolls -- rights self
3. Bounces gently on all fours from quadrupedal position
4. Bounces vertically while on instructor's lap
5. Bounces when seated alone (bounce impetus from instructor)
6. Executes standing bounce with instructor
7. Executes controlled standing bounce and stop with instructor
8. Executes standing bounces and "ins" and "outs" with instructor
9. Executes controlled standing bounce and stops without instructor
10. Executes controlled "ins" and "outs" without instructor
11. Executes standing bounce with quarter turns and half turns with instructor
12. Executes standing bounce with quarter and half turns and stop without instructor

Familiarization phase - part two

1. Drop to quadrupedal position
2. Seat drop to stand (1 trial)
3. Knee drop to stand (1 trial)
4. Seat drop to stand (continuously)
5. Knee drop to stand (continuously)
6. Knee drop to standing position, to seat drop, to standing position
7. Front drop to stand
8. Knee drop to standing position, to front drop, to standing position
9. Knee drop to standing position, to seat drop, to standing position, to front drop, to standing position
10. Front drop to standing position, to seat drop

The Lind Climber or Stegel

The lind climber or stegel is traditionally associated with pre-gymnastics activity -- it is, however, an extremely adaptable piece of equipment, and has gained considerable popularity in recent years as a therapeutic apparatus. It consists of three or more adjustable cross beams (at 16' length), two standards which provide support for the cross beams, a ladder with doweled rungs for hanging activities and a multi-positionable slide. The lind climber is highly

flexible because its beams can be placed in various configurations to promote a variety of developmental and kinesthetic functions such as dynamic and static balance, spatial awareness, upper-body strength, coordination and body control.

Area mats must be placed beneath the beams of the lind climber and over the supports of its standards for safety. In this same reference, children must be spotted at all times -- to be spotted properly, the child can be supported at the waist, by the belt buckle, at the neck, by the collar or by the hands. If the child is capable of walking across the beam by himself, he may be given minimum support at his fingertips -- this is for psychological reinforcement rather than as a physical prop. As the child progresses in ability and confidence, the instructor should position himself slightly behind the child out of his vision range -- such a position further reduces the child's dependence and encourages independent participation. It is important that each child work at a level within the limitations of his ability.

The lind climber, like the trampoline, is a potentially perilous activity if not approached from a graded developmental basis. When introducing a child to the lind climber, he should start with a single beam on a mat surface -- this single-beam configuration is utilized to foster confidence and establish control. Multiple beams are then placed on the mat surface with one edge of each beam raised. Gradually, the beams are raised until they approximate the first beam level (lowest level) on the lind climber. During this familiarization phase, control and confidence are stressed and must be demanded. The actual sequence of activity on the stegels should incorporate a clearly defined beginning or mount, activity or performance phase and a dismount; i.e., can you climb the ladder like a bear (mount) and walk the beams like a crab to the opposite end (primary objective) and then go down the slide (dismount)? Such a sequence provides for economy of movement, safety and motivation. In addition, it is to be noted that, generally, single-beam balance activities at the lower levels precede multiple-beam activities. Likewise, parallel-beam activities directed at strengthening the upper torso precede either ladder or single-beam torso activities.

There is almost no limit to the number of ways the stegel or lind climber may be used. Its primary advantages are that: it can be used to reinforce or teach sound motor developmental and kinesiological patterns; it is a safe and durable apparatus when realistically planned for; it can be used both in the classroom and on the playground; more than one child can be involved at one time; it is extremely adaptable and can be modified to meet the physical and developmental needs of a variety of disabled children.

Swimming

Swimming is a valuable activity for all children; however, it is particularly beneficial for the handicapped child. One of its greatest values is in providing a functional medium for socialization with nonhandicapped individuals. In addition, the antigravity or buoyant effect of water serves to reduce painful contractions and increase range of motion. It should be emphasized that water temperature is a critical variable which must be maintained at a level amenable to optimal psychological and physiological functioning. Water temperature which is relatively cold (below 85° F) tends to reduce circulation to the extremities and effect atypical muscular contractions. Ideally, water temperature should be maintained at 87° to 92° F. Water temperature in this range provides both generalized stimulation and sedation. It elevates tissue temperature; produces relaxation of muscles and soft tissues, reducing pain and increasing joint mobility; promotes circulation and muscular coordination; and functionally accelerates both internal and external respiration. It should also be cautioned that it tends to stimulate bowel movements by relaxing the sphincter muscles in individuals with marginal bowel control; i.e., the deaf-blind or cerebral palsied child. The practice of using doubled cloth diapers, covered by a rubber diaper, can prevent embarrassing situations. For those individuals who have a tendency to remove their diapers, leotards can be worn over the diapers to inhibit this particularly undesirable idiosyncrasy.

Many different approaches can be taken to teach swimming to the handicapped; few, however, are actually based upon the realistic needs of the handicapped. For example, the majority of traditional swimming programs depend upon detailed verbal instruction, demonstrations, and initiations to teach swimming. Exposition or demonstration alone, however, is not a rational approach to teaching swimming to children with auditory or visual impairments. Such children must physically experience or feel the demonstration.

Typically, handicapped children exhibit a variety of inappropriate fears, withdrawal reactions and emotional responses. To facilitate learning, reassurance and control must be maximized; a one-to-one ratio for instructional purposes then is a prerequisite. Likewise, the child should be exposed to deep water from the beginning of instruction so that he recognizes that all areas of the pool, whether 3' or 13', are essentially the same enjoyable environment. At no time should the child be psychologically biased by the instructor's own insecurity and fear of the water -- such fear retards learning and may create unnecessary psychological barriers. The child is never allowed to fail -- he is rewarded for every advancement he makes no matter how small or seemingly insignificant. In this regard, everyone in the pool

should respond enthusiastically when a child performs. Ideally, lessons should be held for one hour, at least three times per week. This hour session should be divided into two 30-minute segments. The first 30 minutes should be solely directed toward swimming instruction; the final 30 minutes should provide the child with a variety of pleasant activities that will reinforce a positive attitude about the pool. The length of the lesson, however, must realistically be adjusted so as not to overexert the child.

The first instructional technique in the sequence for teaching swimming is the dangle or deep water bob; it is used to provide the child with his first deep water experience. Holding on to the side of the pool, in relatively deep water, the child pushes himself under water. Once he is submerged, he raises his arms over his head and floats back to the surface. This functions to demonstrate to the child, first, that he will return to the surface and, secondly, that the water is a safe medium. If the child is reluctant to perform this activity, the instructor can position himself so that the child is between the side of the pool and his torso; in this position he can physically pattern the child through the activity.

The next phase in the swimming sequence is that of the back float. This is contrary to most accepted swimming program procedures; however, children, in particular the handicapped child, prefer this position to the prone float. It is a more realistic position as well because it eliminates the need to teach complex breathing patterns. The instructor should place himself in a partially seated position with his back against the shallow edge of the pool. The child reclines on his back in the water, with his head supported on the instructor's shoulder. In this position, the instructor can support the child at the small of his back with one of his knees. In addition to being a stable and secure position for the child, it leaves the instructor's hands free to pattern the arms of the child. As the child relaxes and feels secure, the instructor slowly lowers him further into the water and lessens the support. The next aspect of the back float is the addition of a basic Red Cross backstroke arm pattern. The child is manipulated and patterned to bring his arms up along each side of his body simultaneously, until his hands are at chest level. He is then patterned to thrust his arms straight outward and then back into his body to the starting position. The traditional frog kick is taught to complete the stroke. It is utilized for three excellent reasons: first, it requires marginal coordination; secondly, it can be patterned easily to complement the rhythm of the arm movements; and thirdly, the pattern requires minimal energy expenditure. A second instructor is utilized to manually pattern the child's kick to complement his arm movements.

To encourage flexion of the knee and hip in the C.P. child, the soles of the feet are pressed together and then patterned in the traditional sequence -- up, out, together. The child should be consistently reminded of the rhythmic sequence of the pattern throughout the lesson, and encouraged to repeat it, if possible.

The third phase in the swimming instruction sequence is that of the time-honored dog paddle. The basic teaching position is facing the child rather than parallel or at his side. From this position the instructor can observe all of the child's facial expressions and body movements. The instructor's hands should be placed palms up under the child's ribs. A second instructor can be engaged to pattern the child's arm movements if the child is large or unwieldy. The second instructor faces the child and reaches around the sides of the instructor supporting the child and grasps the child's wrists. He then patterns the child's arms alternately, duplicating a modified crawling patterning or dig stroke. It is essential that the instructor, who is patterning the arm movements of the child, pattern the movement in opposition to what would be the natural arm pattern for himself. If he does not, the child will reverse the arm sequence and create a negative force inhibiting propulsion. The child then is encouraged to kick with his legs. If he is incapable of coordinating his own movements, then manual patterning will again be required.

The final major instructional sequence in teaching the handicapped to swim is teaching the child some form of realistic breathing pattern while performing the dog paddle. The pattern taught begins with "bubbling" -- the instructor demonstrates by putting his face in the water. He then "bubbles" loudly to induce the child into playing with his face in the water. If the child is visually and auditorially impaired, and cannot imitate the instructor's bubbling patterns, a breathing pattern still can be achieved. The child is supported under the rib cage by the instructor in such a manner so that the child's natural breathing pattern can be determined by the rise and fall of his chest. When he feels the child inhale, the instructor lowers him into the water, and, as soon as he exhales, he lifts him up. Gradually, a pattern is developed and the child learns to breathe naturally. The basic breathing pattern should reflect the following sequence for the dog paddle -- dig, kick, bubble; however, because of the C.P. child's particular anatomical and physiological anomalies, the breathing pattern differs. The cerebral palsied child performs the dog paddle in the same manner as other handicapped children, until he needs to breathe -- at this point the child performs a breaststroke. The breaststroke reduces the atypical head flexion stimulated by the digging motion of the dog paddle, permitting neck extension and the opportunity to breathe. The child then resumes his dog paddle until another breath of air is required.

Once the child has learned the dog paddle pattern, the "pulling-off" technique is used to initiate independent swimming. The child is positioned at the gutter of the pool, facing the instructor. The instructor grasps the child's wrist and firmly propels him out and away from the side of the pool. At the same time, the instructor backs away, reaches over, and grasps the child's neck and slightly pushes his head under water. He quickly reaches under the child's arms and lifts him up before he has a chance to swallow any water. The child is immediately praised and held securely.

It is important that a child learn to tread water to complete his water experience. Moving from a vertical to a horizontal position or from a horizontal to vertical position is an important aspect of being water safe -- it allows the child the opportunity to breathe and rest. Treading water can be thought of as a two-component activity involving the dig pattern of the dog paddle and the reciprocal leg pattern associated with riding a bicycle. At one corner of the deep end of some swimming pools, there is a series of six-inch-wide ledges approximately four and one-half to five feet below the surface of the water. This is a treading corner and, as the name implies, it is utilized to teach treading. Two rope markers can be crossed near this corner to create a surface for the instructor to rest against when his feet are braced against the submerged ledges. The child is positioned facing toward the instructor, away from the corner of the pool. The instructor gathers the child's trunks at the waist and gently pulls the child toward himself. In this position the child can be taught first the vertical float and then treading. It should be emphasized that the traditional "dig" - "cycle" tread pattern associated with treading water represents only one functional treading pattern. The most practical pattern will be a "natural" treading response. Once the child can both swim and tread, he should be encouraged to utilize both in his swimming pattern (i.e., swim, tread; swim, tread).

BIBLIOGRAPHY

Ayres, A. J. Sensory Integration and Learning Disorders. Los Angeles: Western Psychological Services, 1972.

Bobath, B., and Karel Bobath. "Cerebral Palsy," in Physical Therapy Services in the Developmental Disabilities. Edited by P. H. Pearson and C. E. Williams. Springfield, Ill.: Charles C. Thomas, Publisher, 1972.

Chusid, J. B. Correlative Neuroanatomy and Functional Neurology. Los Altos, Calif.: Lange Medical Publications, 1967.

Finnie, N. R. Handling the Young Cerebral Palsied Child at Home. New York: E. P. Dutton & Co., 1970.

Illingworth, R. S.: The Development of the Infant and Young Child: Normal and Abnormal (Fifth edition). Baltimore: The Williams & Wilkins Co., 1972.

Illingworth, R. S. "Rehabilitation of the Patient with Cerebral Palsy" in Rehabilitation Medicine (Third edition). Edited by H. A. Rusk. St. Louis: The C. V. Mosby Co., 1971.

Mueller, H. "Facilitating Feeding and Pre-Speech" in Physical Therapy Services in the Developmental Disabilities. Edited by P. H. Pearson and C. E. Williams. Springfield, Ill.: Charles C. Thomas, Publisher, 1972.

TOTAL COMMUNICATION

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Total communication (TC) is a communicative process used by deaf children. It is a nondiscriminatory approach to their human interactions and educational experiences. There are no specific instructional or rigid methods, but it is an approach based on a philosophy that every child is entitled to equal educational opportunities. In order for children to take advantage of these opportunities, there are two prerequisites for cognitive development. The primary prerequisite is that the deaf child's environment from infancy has to provide language acquisition and input. This input should be presented so that it can be received visually. Secondly, the method of expressive communication should be readily accessible to the deaf child by age two. This will enable the child to express himself, receive feedback conceptually and grammatically, and enable him to utilize English syntactical rules. In other words, it is important to parallel the cognitive development of a hearing child.

Total communication is different from the simultaneous approach in its emphasis and its purpose. The simultaneous approach is used merely as a communication tool by the teacher to assist in conveying content.

The emphasis in total communication is much more comprehensive. It not only ensures two-way communication but begins at an early age to provide a full language environment. At the same time, it retains the goal of oral/aural training to the degree that the child is capable, without risking language and academic deprivations. The purpose is to not only gain knowledge but to develop the child's skills to the fullest of his potential without slighting any aspect of growth.

Dr. David Benton describes total communication as the deaf child's right to learn to use any and all forms of communication available to develop language and psychosocial competence. This includes any communication modes, including gestures, speech, formal signs, fingerspelling, speech-reading, reading and writing. Every deaf child should also be provided the opportunity to learn to use any residual hearing he may have and be provided with the best possible electronic equipment when amplification is helpful.¹

¹ Kenneth Brasel, "Total Communication," The Deaf American, September, 1974.

There are six basic methods of communication utilized by the deaf: (1) oral; (2) auditory; (3) Rochester method; (4) total communication; (5) simultaneous; and (6) manual approaches. The main components of the oral approach are speech, speechreading, and the use of residual hearing -- amplification is essential. Reading and writing are used for clarity.

The main components of the auditory approach are the same as those of the oral method, but with a heavier stress placed on auditory skills. The Rochester method adds fingerspelling to speechreading, speech, and the use of residual hearing. Again, reading and writing are supplementary.

Another approach -- total communication -- uses signs (concepts), speechreading, residual hearing, and speech as the principal elements. Fingerspelling, reading, and writing are used for clarification. The simultaneous approach utilizes signs, fingerspelling, and speechreading as the main components for success; however, the use of residual hearing, reading, writing and speech is supplementary. Finally, the manual approach uses signs, fingerspelling, reading, and the written word for effective communication.

Sign language is a generic term which refers to American Sign Language (Ameslan -- ASL), Signed English (Siglish), Manual English, Signing Exact English (SEXE -- SEE II), Linguistics of Visual English (LOVE), Seeing Essential English (SEE I), Rochester method, and gestural languages.

The sign language that is used by the majority of the deaf in the United States is the "American Sign Language (ASL)," more commonly known as "Ameslan." From this basic language -- Ameslan -- a number of "sign systems" have been developed, most of which represent or parallel the English language.

Most deaf people in the United States use a language known as Ameslan. It has all the requirements and features of a genuine language. The features include semantic rules, syntactic rules, morphological rules, transformational rules, and phonological rules. Briefly, semantic rules deal with how words relate to each other and their logical interrelationship. Syntactic rules have to do with the sentence sequencing; morphological rules are concerned with morphemes, the smallest meaningful units of speech, which are roots, affixes, and stems. Transformational rules deal with the adding, deleting, or moving of words in a sentence to change its meaning. Phonological rules dictate the sounds which can be used within any language.

The greatest difference that exists between Ameslan and English is in

its syntax. Ameslan divides the sentences into three main parts and sequences them in the order in which they visually occur.

The first part of the sentence is usually the most concrete sign, commonly a noun, which sets the scene or establishes a framework for the rest of the sentence. For example, "I get sick at the sight of blood." Visually, "the sight of blood" is the most vivid part of the sentence, so it would come first and be signed "The sight of blood makes me sick." The stimulus, or the cause of what happens comes first. "The sight of blood" causes the sick feeling.

The signs which in some way describe, explain, or elaborate the stimulus occur next in the sentence. Usually, these are adjectives, adverbs, and verbs. For example, "I couldn't see, because the man in front of me was too big." The stimulus is "the man" and the description is "in front of me was too big." This sentence would be rearranged to "The man in front of me was too big, so I couldn't see."

Following the description of the stimulus is the result, the product, or a state of being. In the sentence "The little boy was excited by the pageantry of the parade," "the parade" is the stimulus, "the pageantry" is the descriptive part, and the result is "the little boy was excited." Therefore, the sentence in Ameslan would be signed in this order: "The parade and all its pageantry excited the little boy."

Pitch or intonation, juncture, and breath force are used to emphasize the stress pattern in English. On the other hand, facial expressions and variations of speed with which the signs are made accompany the signing for further clarification in Ameslan.

There are no affixes in Ameslan, but the meanings are present. In Ameslan the plural is a repetition of the sign. For example, the sign for child repeated becomes children. Quantifiers are also used to show plurality. For example, if one signs 12 week, the word week becomes weeks by association. A sign repeated can also show regularity as in the signs month month month which means monthly.

Because there is no way to express tense in a verb, tense indicators are used in Ameslan. For example, the signs for "eat," "eating," "ate," or "eaten" are signed with one sign. So, Ameslan uses tense indicators to specify when an action occurs. To sign the word "ate," an indicator such as finish, yesterday, etc., must be used, and signed finish eat yesterday, etc. In other words, a sign which denotes a specific time must be used to express the tense.

A characteristic common to Ameslan and to many other languages is the lack of the copula. Also, Ameslan does not have the same set of determiners as in English. These two contrasts in grammatical structure frequently create numerous errors in the writing and speaking of English by signers who have not completely mastered the English system.

Furthermore, in the translation of Ameslan to English, it is not a matter of substituting a sign for a word. For example, the English question "Have you eaten yet?" and its response "No, have you?" would be signed "Eat finish (question indicator or a shrug, etc.)" and "Not yet you (question indicator)."

Signed English (Siglish) is the most common sign language seen in the classroom. It follows the English grammatical system and is in reality a visual, conceptual form of the English language.

Siglish translates Ameslan signs for English words. Mainly it conveys or communicates an idea usually through fingerspelled words and signs; generally, tense, plurality, and word endings are omitted. Therefore, a compound (two morphemes) word in English may or may not be represented by a two-morpheme sign word. The only similarity here is that the meaning of the compound will be the same, and not its elements. The separate morphemes in the compound may not have meanings similar to the English morphemes. Because Siglish is concept based, a sign is usually represented by a specific thing.

The signer and the receiver using Siglish must have a good knowledge of English, because the signs are joined together more by the rules of standard English than by the rules of Ameslan. For example, the signs perhaps, finish, be, forget mean nothing in Ameslan but are produced and understood as the Siglish equivalents to may have been forgotten.

Another approach to communication is Manual English, a visual form of the English language. It is based primarily on the signed vocabulary of Ameslan used in conjunction with fingerspelling in the correct English syntactical and grammatical form. It complies with the usage of verb tense, prepositions, determiners, plurality, and all word endings of the English system. In Manual English a word can be partially signed and partially fingerspelled (e.g., working = work + fingerspelled -ing) or both the root and the ending can be signed. This method was developed at Washington State School in Washington.

In 1962 David Anthony, a deaf man, was working on the Deaf Research Project at Lapeer State Hospital, Michigan. He noticed the scarcity of

frequently used words in Ameslan and that many signs could represent one word. For example, the word glass is signed one way for drinking glass, another way for window glass, and still another way for eyeglasses. Furthermore, he realized one sign could represent many words with the same root, but different functions: beauty, beautiful, beautifully. This same sign was used also for the synonyms lovely, pretty, and attractive.

Because of all these confusions with Ameslan, Anthony developed Signing Essential English (SEE). By 1969 a group of people formed an organization for the purpose of developing signs to represent English. They all believed that acquiring good English is a tremendously difficult task for a child born deaf and that the most important factor in acquiring good English is an understanding of its syntax or structure. And so, the feeling for structure is more important than the ability to spell the word immediately. Therefore, English should be signed as it is spoken. This is especially true of idioms.

They also realized that normal input must precede normal output. In other words, if aural input is blocked, visual input must be used. And because the visual cues of speechreading are too small and ambiguous to make normal, natural language learning possible, sign language is easier to see than speechreading.

Because the patterns or structure of English may be easily added to sign language, members of the group also realized that it is easier to sign all parts of a sentence than to sign some and spell others. And most significantly, they believed that any specific sign should mean one thing and one thing only.

Because of different ideologies several members of the group separated and developed systems of their own. In 1971 David Wampler published "Linguistics of Visual English (LOVE)," David Anthony published "Seeing Essential English (SEE I)," and in 1972 Gerilee Gustason and others published "Signing Exact English (SEE II)."

The systems are based on the fact that a basic word has three characteristics: its meaning, its spelling, and its sound. A basic word has no affixes attached to it. One may determine whether a word should have one or more signs. If any two of the characteristics mentioned above were the same (spelling + sound, sound + meaning, or meaning + sound), then the word would have the same sign. This is intended to avoid confusion for the deaf student and make him aware that one word could have many meanings. So, with the signs for glass, whose spellings and pronunciations are consistent, regardless of the meaning, the same sign will be used. If any two of the characteristics are different, such as the word boy, as in a young boy, and the word buoy, as in a life buoy,

where the meanings and spellings differ, the signs assigned will be different.

In all of the systems, correct English syntax is followed exactly and always has the same sign regardless of its meaning. Also, the speaking and signing must be done simultaneously.

Each word form or part, i.e., word roots, prefixes and suffixes, are represented by a single distinct sign whatever the meaning or the part of speech of the word in Seeing Essential English (SEE I).

SEE I classes compound words as either "straightforward," or "not-so-straightforward." Words that are "straightforward," as cowboy and blackboard, are signed as two words, and, when put together, still retain a proper meaning of the compound word (e.g., cow + boy). "Not-so-straightforward" words include words like butterfly and understand, which, if they are separated, lose their original meaning. These are given their existing sign, and if none exists, a sign is invented.

SEE I gives each morpheme a sign; therefore, it has a great number of affixes. SEE I has a large amount of irregular verb endings and other varieties of English word forms.

The development of Linguistics of Visual English (LOVE) was primarily for preschool and kindergarten deaf children. The basic difference of LOVE and SEE I is the word form. LOVE signs represent morphemes. The morpheme structure of English composes the criteria by which Ameslan signs are accepted or modified. The same number of signs equal to the number of morphemes are given to compound words, if both signs that are put together are related to the meaning of the morpheme element; i.e., cowboy = cow + boy. As in SEE I, a compound word is signed as a single morpheme, if it has a meaning different from that of its components parts. For example, the word forget is not signed for get. A complex word will always have a LOVE sign equal to the number of morphemes in the English word; i.e., kingdom = king + dom.

Whenever possible, signing and its movements are related to speech rhythm. And so, a three-syllable word will have a three-movement sign. LOVE appears to be based more on a sound system than on the true definition of a morpheme. This is illustrated by the fact that a free morpheme (one that has meaning when found alone or separate) will be considered unique if it has the same spelling and sound but not the same meaning, which usually is an integral part of a morpheme.

The past participle forms of verbs such as can, will, shall, and may (could, would, should, and might) are represented by signing the verb plus

a sign for the perfect form (-en), regardless of spelling, i.e., can + en, will + en in SEE I. However, the past participle in LOVE is signed according to its sound or the last letter of its spelling. Thus, could = can + d, would = will + d, and might = may + t.

Signing Exact English (SEE II) is intended to be a second language for deaf children from early childhood. The signs are depicted by drawings and English descriptions. It has an approximate vocabulary of 1,700 words and 70 affixes.

The structure of SEE II is more closely related to Ameslan than is LOVE or SEE I. It has many of the traditional signs as roots for various vocabulary words. The basic idea of SEE II is to have one sign for each word or concept; it is not necessary to have a sign for each morpheme.

The basic difference of SEE II and SEE I is in its root words. For example, SEE I uses the root word "gene" as a basis for the signs of words like general (gene + al), generous (gene + -ous), and genetic (gen + -ic). However, SEE II will only accept genetic as a word that would use the root sign gene. Thus, SEE II would give general one sign and closely relate it to the original Ameslan sign.

SEE II and SEE I have the same rules for compound and complex words. The signs used in SEE II are not absolute, but can be used as a basis for the development of new signs if a better way to sign them is found. (Handout -- The Rationale of Signing Exact English -- Gustason, G.)

Fingerspelling visualizes English utterances with hand configurations for the 26 letters of the English alphabet. Most often, deaf people use it in conjunction with Siglish as a supplement to signing in English order.

The Rochester method uses only fingerspelling. Advocates of this system feel that signs interfere in the acquisition of good English and, therefore, have no place in a school which has good English as an objective. Because it can give an exact representation of the English language, fingerspelling is used. The Rochester method always uses speech or lip movements in conjunction with fingerspelling. Those critical of this system say that, when conversation in fingerspelling is continued over a long period of time, the sender and receiver become easily fatigued.²

² The explanations of the various sign language systems were abstracted from American Sign Language and Related Sign Systems for the Deaf, submitted in Partial Fulfillment of the Requirements for C.D. 561B, Seminar in Speech Problems II, by Lawrence J. Solow, December, 1973.

Recent developments of sign systems attempt to parallel the English language. This gives educators new methods of teaching English to deaf students. It is hoped that these systems will help solve some of the problems deaf students have with the English language.

TECHNIQUES OF COUNSELING

Presented by Finis E. Dew

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I. Behavior Goals of Children

Two things must be kept in mind when one is attempting to modify behavior. The first is that an individual is a social being, and, to be a fully functioning human being he must learn to get along with people. The second is that all behavior is goal directed and there is a pay off value involved in all actions. No person behaves without intending to affect others. One is not always aware, however, of the purpose of one's own behavior.

The interaction in the family is the most important factor affecting the way the individual feels about himself, the way he relates to others, and the way he develops his own life-style. A child's life-style is formed from three to eight years of age, and is based on the way he has been reared. Some possible life-styles which develop are the pampered child, the controlling child, the baby, the victim, and the martyr.

One can look to the family constellation to discover some of the reasons for a child's behavior. The child's position in the family is one factor to be considered. The first-born-child is usually given more responsibility. He is put in charge of the younger siblings and is expected to set a model of behavior for them. The only-child generally learns to get along well with adults. He may be somewhat lonely, self-centered, and pampered. The second-born often feels that he is in competition with the first born. The middle child may cry a lot. He feels left out because the youngest usually gets attention from mother and the oldest from father. The baby in the family is a natural charmer and loves attention. Where there is a handicapped child in the family, he is often treated as the baby no matter what his position.

Some other interactions to look at are: (1) sibling rivalry - often a result of what the parents view as constructive competition where comparisons are made among the children; (2) poor communication between parents - the child feels that something is wrong but he can't express it, so it shows up in his actions; and (3) improper methods of discipline - used in the home and/or in the classroom. The typical approach to discipline has been the autocratic system, based on reward and punishment that is imposed at will, according to one's feelings at the moment. Punishment is often a result of frustration. The democratic system is based on natural consequences. Rules are set up

which have a logical cause-effect relationship. The child has the choice of following the rules or suffering the natural consequences. Children want guidance regardless of what they may say. Rules provide them with consistent expectations about their behavior. This allows them to feel that they are trusted and are being dealt with in a just manner.

To understand the child's pattern of movement through life, one must become sensitive to the interaction inherent in routine situations. For example, suppose a child dawdles every morning and "forgets" to do most things that are considered to be his responsibility. His mother responds with constant reminders and does many things for him. At school, his teacher has to remind him and push him to get him to work. What is the interrelationship? Actually the child is, through his behavior, provoking others to assume his responsibilities. This behavior, then, may become a permanent pattern -- a way of moving through life.

Any disturbing behavior has four goals, which can be observed in all young children up to the age of fifteen. These are: (1) attention-getting; (2) power; (3) revenge; and (4) display of inadequacy. These are means by which the child tries to find status, and at this age his status depends on the reactions he can get from adults. The disturbed child may be either active or passive and may use constructive or destructive methods. Only if the child feels accepted will he use constructive methods; antagonism is always expressed in destructive acts. We have been brought up to believe that children who are actively destructive grow up to be criminals. Actually, it is the passive child who bears closest watching, since this child's problems get deeper and deeper. It is a sad commentary that increase in status and personal value is often more easily obtained through useless and destructive means than through accomplishments.

Attention-Getting Behavior

The child's goal of attention-getting behavior is attention and service. This goal is operative in most young children, and its predominance is the result of the method by which children are brought up in our culture. The young child has few opportunities to establish his social position through useful contribution. The welfare of the family usually is taken care of by older siblings and/or adults. The child requires constant proof that he is accepted. He may first try to get attention through socially acceptable and pleasant means such as gift-giving demonstrations of affection. When these methods are no longer effective, he will try all conceivable methods to get attention. Unpleasant by-products like humiliation, punishment, or even physical pain do not matter -- children prefer being scolded, punished, and even beaten to being ignored.

When we deal with attention-getting behavior, we have to recognize that we often inadvertently reinforce behavior we do not want. The best rule to follow is not to do anything for a child that he can do for himself. First, try to ignore the behavior. Then attempt to create situations which will change destructive methods into constructive methods. Some of these constructive methods are: (1) call the child by name when he is misbehaving and remain inactive until he responds; (2) use humor; (3) express curiosity if he whispers; (4) ask his opinion about the last remark if he is inattentive; (5) invite the class to observe if he clowns; and (6) ask how many times he thinks he needs attention. It helps to greet the child at the door and to chat for a minute, giving him attention before class begins. The child should be given every opportunity to get encouragement and recognition for useful, active efforts and accomplishments.

Power Behavior

The child's goal of power behavior is to be boss. He tries to prove that he can do what he wants and refuses to do what he should. No final "victory" of parents or teachers is possible. In most instances, the child will "win out" because he is not restricted in his fighting methods by any sense of responsibility or moral obligation. If the parents are able to score a "victory" and overpower the child, this only makes him more convinced of the value of power, and more determined to strike back the next time with stronger methods. A power-driven child is always anxious to defeat those who try to suppress him. A child who wants to be powerful generally has a parent who also seeks power. If mother insists on her way, the child imitates her and they become involved in a power contest. Each feels honor-bound to do just the opposite of what is being asked. The harder parents try to "control" their children, the less success they will have. A person cannot fight alone; thus, when mother learns to do nothing, such as withdrawing during a power contest, she dissipates the child's power. This can be the beginning of the establishment of a healthier relationship with him. The use of power only teaches children that strong people get what they want.

To deal with a power-driven child in the classroom: (1) encourage him to help other children, physically or academically; (2) openly admit that you have no power over him; (3) make him feel he has it in his power to help you; and (4) explain to the class the student's attempt to show power and that everyone must recognize his superiority.

Revenge Behavior

The child's goal for revenge behavior is to hurt us. This battle between adults and children for power and domination may reach a point where the

parents try every conceivable means to subjugate the culprit. The mutual antagonism may become so strong that each party has only one desire -- retaliation, to revenge his own feelings of being hurt. This type of child knows where he can hurt the most and takes advantage of the vulnerability of his opponents. He regards it as a triumph if he is considered vicious. Since that is often the only triumph he can obtain, it is often the only one he seeks. Revenge behavior presents one of the most serious problems and is least susceptible to reason.

To deal with revenge behavior, set up situations where the child can trust you. Use group discussions to help promote mutual understanding. The teacher can, in private, solicit the help of some pupils to take special interest in the revenge-oriented child, to draw him into their group and demonstrate appreciation. The teacher and children need to give each other moral support lest they become discouraged.

Inadequacy Behavior

The child's goal of inadequacy behavior is to be left alone with no demands on him. He expects only defeat and failure and stops trying. He hides himself behind a display of real or imagined inferiority. He uses his inability as a protection so that nothing will be required or expected of him. By avoiding participation or contribution, he tries to preclude more humiliating and embarrassing experiences.

To deal with inadequacy: (1) give encouragement; (2) have general discussions on how to avoid discouragement; (3) shorten the list of problems so as to avoid presenting too many failures at a time; and (4) have the children keep their hands down till the one called on has time to respond.

II. Parent-Teacher Relationships

Because parents are more likely to listen to other parents, a group counseling situation can reach more parents and can often be more effective than a parent-teacher interview in bringing about changes. When a parent group meets for the purpose of dealing with problems, a smaller "C-group" of six to ten people can be formed from the larger group. This C-group gathers in an inner circle, with the larger group outside the circle. A group leader is chosen, and it is understood that each member of the group has responsibility for presenting a problem for the group to discuss. The responsibilities of the parents in the C-group are to consult, clarify and confront one another; collaborate on practical issues; show concern and care; be confidential; and show commitment to change. The parents in the larger group may join in the discussion at any time, and, if someone in the outer

group relates well, then he may become a member of the C-group also. In this manner the parents can share their emotions with others who understand. They discover that their concerns are universal concerns of many parents. If there are new parents who have agreed to come to the group counseling situation, try to get them out to several sessions before they themselves are counseled.

Parents are upset when they do not know what is going on. The teacher should be in contact with them before trouble begins. Parent-teacher meetings can serve this purpose. The meetings are also useful as a means of uniting parents in a common cause. Where the parents and the teachers have a common concern about the children's welfare, the parents should be encouraged to band together with teacher support to go before the educational directors and the legislature. Parents have been found to be the most effective force for bringing about changes in the educational system.

Some of the methods which might be used to enlist the aid of the parents and to improve their attendance at meetings are:

1. Flyers announcing the time, place, and purpose of the meeting.
2. Phone calls.
3. Notes for them to respond to, asking when it could be convenient for them to come to a meeting.
4. Individual conferences in the home or in the school -- personal contact may be needed before parents will join the group.
5. Courses that will be of common interest such as sign language classes.
6. Newsletters home - parents should help plan and set them up, and they should be allowed space in the newsletter.
7. Involvement of ministers or other neutral persons who have a strong influence on the parents - have them speak at the meetings.
8. Zero in on the fathers - they tend to be more consistent in their methods of handling their children - appeal sense of worth, as someone who can help solve problems.
9. A committee organized just for the purpose of getting the parents out -- enlist a community liaison person or an active parent to organize it.
10. Social gatherings.
11. Appeal to other family members if the parents are not interested -- if the family is Spanish, appeal to the godparents; if the family is black, appeal to the grandmother.
12. If a man who is not the father is living with the mother, and is sincerely interested in the child, get him to come.

Remember that economically disadvantaged families are functioning at the survival level. If they do not show up for the meetings, do not be irritated

and annoyed. They may want to come, but survival comes first.

It is important for parents to have some part in the planning of the parent-teacher meetings. One way to involve them in the planning is to use questionnaires to find out their interests. A self-addressed stamped envelope should be included to encourage them to respond. The parents can participate in the arrangements for the meeting by inviting the guest speaker. Let them choose the spokesperson to conduct the meeting. The teacher can remain in the background and can act as a consultant if a problem arises. The administration should remain in the background and not exert authority if a nonthreatened, supportive, and communicative parent-teacher exchange is to occur. Where there are problems with the administration governing the parent-teacher meetings, the Citizens Advisory Council can be asked to intervene.

To run an efficient meeting, remember to:

1. Keep the business meeting short.
2. Start on time.
3. Provide an activity room for the children.
4. Provide refreshments.
5. Have the students included -- directly, as in a skit; or indirectly, as in a slide show of the classroom activities.
6. Set up a question and answer session.
7. Provide paper and pencils.
8. Have scrapbooks with pictures of the parents involved in activities that they organized and carried out.

To get parents to work together in a nonthreatening, supportive manner, they might be asked to help with the classbooks or yearbooks. They can set up workshops based on their needs. The workshops can be videotaped to give the parents recognition, to serve as an educational tool, and to have records of the workshops. Films of these workshops and of classroom activities can be shown to parents who live too far away to be able to come to the parent meetings. When advertising the workshops, give the title, the names of the consultants, an overview, and anticipated outcome.

Once the parents come out, there will be some parents who take the teacher aside to ask about specific problems. These parents can be asked if they know of any other parents who have concerns similar to theirs. The smaller "C-groups" can be formed of people with similar concerns and/or people from the same neighborhood. The teacher or counselor can agree to meet them at certain times which are convenient for everyone concerned,

thus setting up smaller parent meetings which meet more frequently than the larger parent meetings held at the school. The meetings should be held weekly or bimonthly in order to bring about changes. It helps to have the meetings in the homes, but the parents should initiate this.

Have a plan to present at the parent meetings, and be ready with a backup plan because parents can be expected to react negatively. Enlist the parent's aid by saying to the parent "What do you think we should do if this doesn't work?" Ask parents what they can do to help, and if a parent responds, ask if he is willing to take part. By making a commitment in front of the group, he is more likely to actually assist with a project; and, once he does take part, the group recognizes it and may ask for more help.

When a parent has been attending meetings because he has been getting assistance with a concern of his, he may want to drop out if his problem is solved. To maintain his interest he can be encouraged to make suggestions to other parents about their problems. He will want to return to hear how well his suggestions worked.

A handbook should be made available that is geared exclusively to the parents and their needs. It should be short, attractive, written at the parents' level - not filled with professional and intellectual jargon - have clear directions on how to use it, and be available in the language of any minority groups represented at the school. To make it attractive, the color of the paper can be varied to divide it into sections, script type can be used, and pictures and poetry can be included to break up the information. The cover should be durable and attractive. Acknowledgments should be expressed and should include everyone who assisted with the handbook. The handbook should include information about the special personnel in the school -- their duties, office hours, office locations, and how they can be contacted. The parents will also want to know about individual classroom procedures, any special equipment that is used in the classrooms, and if there are any special resource rooms. Parents should be informed when school begins if they have to provide any classroom materials and supplies. Information should be included about the transportation system, rules and regulations, the type of reporting used, emergency procedures, and any other valuable information such as library and cafeteria services.

A meeting should be held for the purpose of reviewing and explaining the handbook to the parents. Five or six people who understand it thoroughly might be chosen to be advisers to the other parents. Time can be allowed for discussion and possible revision of information presented in the handbook. Areas of particular interest to raise as topics of discussion at the meeting are classroom policies and procedures, grading procedures, services of

specialists in the classroom, and outside services and agencies. The administration should be made aware of available outside agencies and the services they provide. Another area of special concern is the welfare needs of the parents.

If a summer program for children has been planned, information should be provided for the parents about the type of handicap the program handles, the accepted age range, the length of the program, its beginning and ending dates, time of day, transportation, location, director, and registration procedures. A list of places to contact for information about other summer programs should be provided to parents, including: public schools, the city recreation office, the city library, community centers, private schools, universities or colleges, art galleries, camps, churches, riding academies, national and state parks, automobile associations, and chambers of commerce.

III. Teacher Effectiveness

For a teacher to be effective, he needs to have an understanding of himself and the ability to constructively judge his own actions. It helps to have an understanding of the assimilation process that all individuals use to adapt to and cope with their environment. In assimilation there are three ways of looking at oneself -- the ideal self, the perceived self, and the real self. The ideal self is the image an individual has of the way he would like to be. The perceived self is the way he actually believes he appears to others. The real self is the way he performs. This involves the way the individual acts, dresses, talks, and thinks. If the perceived self is not in accord with the real self, then an individual will not be as effective in his actions. He may force himself to fit into certain standards without recognizing that his real self is contradictory to these standards. If he does come to identify with his real self, he may find it necessary to break away completely from the standards. Or, at times, he may mold himself to meet the standards in order to survive in the environment, while recognizing the existence of and being true to his real self.

Teachers often avoid confrontation which causes them to deny the real self. They feel that it is wrong to be angry. Actually, being angry is a healthy sign when one knows how to vent the anger in a positive way. Parents often become much more trusting and respectful of teachers when the teachers exhibit justifiable anger. The teacher is less effective with the children if he feels guilty for venting his anger, because the children use the guilt to manipulate the teacher.

A good way for the teacher to evaluate himself in action is to look at

videotapes made in the classroom. Some children may not be able to learn from a particular teaching style. They may shift to attention-getting behavior if they can't grasp the information that was presented. When this occurs, the teacher should attempt to either modify his style or recommend that another teacher might be able to do a better job with certain children.

There are cultural differences that the teacher needs to be aware of. For example, the comfortable body distance for speaking in the black culture is fourteen to twenty-one inches, whereas for the white culture, it is twenty-eight inches. A white teacher who backs off from a black child, so as to be at a comfortable distance, can cause the child to feel rejected. A white person looks the person he is conversing with in the eye when he is listening and he looks away when he is talking. It is the opposite situation for the black person.

Games can be fun and educational. They are a safe area for the parents to use to improve their relationship with the child at home. The following are some tips to use for the selection and use of games:

1. Select games which provide practice needed by the children and are of interest to them.
2. Use simple games with young children.
3. Teach games as you would teach other activities; particularly make use of demonstrations.
4. Protect the children's feelings in the games as in other activities. Encourage cooperation rather than competitiveness.
5. Teach the child that he must play the game by the rules.
6. Before beginning, discuss and agree upon who is to take responsibility for putting away the game materials in good order.
7. Accept only good work in the games as in other activities.

Seminars can help improve relations among teachers. They should get together several times a week to share in both the positive as well as the negative aspects of teaching. A teacher can discuss a problem that he is having without being personally threatened; and another teacher might be able to suggest something that worked for him in a similar situation.

When a humanistic quality is added to the working situation, the staff develops a more positive attitude. It has been found that teachers do a much better job if they get away from the physical plant every so often. When offering in-house workshops, retreat to another place if possible to hold the workshop.

There is a need for sessions dealing with health problems. There should

be bimonthly meetings with doctors, so the teacher can report changes in behavior, and can ask about behaviors related to the medication and changes in medication for the children. The teacher can work closely with the school nurse, who can inform the teacher if a doctor is not available for counseling. The teacher should at least know the side effects of the medication, and how to handle any problems which might arise due to the medication.

BIBLIOGRAPHY

- Beecher, Margaret and Willard. Parents on the Run. New York: Grosset & Dunlap, Inc., 1966.
- Bruner, Jerome S. The Process of Education. New York: Random House, Inc., 1960.
- _____. Toward a Theory of Instruction. New York: W. W. Norton & Co., Inc., 1968.
- Cronlund, Norman E. Sociometry in the Classroom. New York: Harper & Brothers, 1969.
- Dinkmeyer, Don and Rudolf Dreikurs. Encouraging Children to Learn: The Encouragement Process. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1963.
- Dreikurs, Rudolf. Psychology in the Classroom: A Manual for Teachers. New York: Harper & Row, Publishers, 1968.
- _____. Social Equality: The Challenge of Today. Chicago: Henry Regnery Co., 1971.
- Erny, Pierre. Childhood and Cosmos. New York: Independent Publishers Group, 1973.
- Grey, Loren. Discipline Without Fear. New York: Hawthorn Books, Inc., 1974.
- Grey, Loren, and Rudolf Dreikurs. Logical Consequences. New York: Hawthorn Books, Inc., 1968.
- Holt, John. How Children Fail. New York: Pitman Publishing Corp., 1964.
- _____. How Children Learn. New York: Pitman Publishing Corp., 1969.
- Jersild, Arthur T. When Teachers Face Themselves. New York: Teachers College Press, Columbia University, 1955.
- Kohl, Herbert. 36 Children. New York: The New American Library Inc., 1973.
- Kozol, Jonathan. Death at an Early Age. Boston: Houghton Mifflin Co., 1970.

ATYPICAL DEVELOPMENT

Presented by Cathy Groves
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"The notes presented below were taken during lectures dealing with the following topics:

1. The effects on the family system, on the mother-child relationship, and on the siblings when there is a handicapped child in the family
2. The effects of the handicapping condition on the child's development and modes of intervention as the child approaches developmental milestones
3. Views of adaptive and maladaptive self-stimulating behaviors with approaches for intervention

The notes are sketchy and are at times out of context. It is hoped that the reader might write the speaker to receive a more complete idea of the material presented." (Cathy Groves)

I. Preparation - Pregnancy

The first phase to be considered is the preparation the mother makes for the child while the child is still in the womb. She deals with this in two ways. One way is the development of fantasies about the unborn child; e.g., dealing with the sex of the child, the color of the hair, the clothes the child will wear, and even the facial structure the mother wishes her child to have. The mother, in fantasizing a beautiful child, is ready for immediate attachment and nurturing of this child. This is essential for the child's development.

On the other end of the continuum is the fantasy and fear of having an atypical monstrous child. This fantasy is not dwelt upon. Therefore, the mother of an atypical child is poorly prepared because all bad thoughts during pregnancy had been quickly repressed. The physical appearance of the newborn is of central importance to the mother -- the most difficult thing for her to handle is distortion of the facial features. She needs instant affective responses, most of which come from the child's face.

If the child is only minimally affected, although the child's mother might sense some difficulty, those around her offer reassurance, affording

her partial and temporary relief. Rubella children often look comparatively normal, and it is their heart defects which often are noticed first. At this point, the child's mother experiences a loss just as if there had been a death -- it is the loss of the hoped-for child represented by her extensive fantasies which began and developed during her pregnancy. The mother should be allowed to experience a period of shock, disbelief, anger, disappointment, and denial. However, the entire community comes to her to tell her to be strong and to be a good mother to her child. If the child actually had died, the community would have allowed her to grieve normally. Some mothers may still be going through the mourning process when the child is three years old.

The parents of a multihandicapped child face a complex mourning process. There is always one more problem being diagnosed in their child -- first it may be the blindness, then the deafness, then the heart defect, and then the neurological damage. The mourning process may be prolonged and begin again with each new diagnosis.

One should begin by asking the parents if there is anything in particular that they would like to see improved at home. This will usually involve feeding, sleeping, or holding. Give them something to do at home that is sure to be a success. Don't allow them to fail at home alone, since this will increase their feelings of inadequacy. It also tends to make them think the teacher has magical powers that they as parents do not. It is essential to support all of the efforts of the family, so that if they suggest an activity for their child, make every attempt to be supportive. If the family makes an unrealistic demand such as "I want my child to talk," don't patronize them, but be realistic. Explain the steps which are necessary to acquire speech, and outline exactly those avenues you plan to use. Explain the need for support and follow through at home.

II. The Family System

The system begins with the mother-father relationship. There is inherent stress between the two when there is a handicapped child in the family. A great deal of the mother's energy is often being used on the child, and the handicapped child is not replenishing her energy. Therefore, the mother may look to the father to do this. The father, however, resents her spending all of her time on the child when he needs her too. The extended family may not provide help either. They may not understand, may not want to help, or may tell the already insecure mother that she is doing things wrong. This often may cause a break with the extended family because of such difficulties.

The parents often feel insecure about using babysitters. They may

think that a babysitter is not equipped to deal with their child. For such reasons, the family may avoid babysitters altogether. They are afraid of having to endure shocked stares and embarrassing questions. When the family ventures out into the community, they have to deal with the shame they feel because of their imperfect child. So they tend to become isolated within their nuclear family, and thereby lose possible available support from outside sources.

Research indicates that the siblings of the handicapped child also face many difficulties. Those siblings who are younger than the handicapped child seem to have the hardest adjustment problems, since there is often a temptation for the parents to be overconcerned about their development. Any hint of abnormality may cause concern on the part of the parents. The sibs may fear that whatever happened to their handicapped brother or sister may, at any time, also happen to them. They often suppress normal childhood fantasies thinking that such fantasizing is a sign that they are "crazy" or abnormal like their sibling. The younger child may, at the other extreme, adopt a handicap. He may think that this is the only way for him to fit into his family. Or he may act out in order to get a share of the attention which is being heaped on the handicapped child.

It may be a good idea for the whole family if the siblings were included in the school program. If the younger siblings see other children similar to their own brother or sister, this could help to reduce their shame. If they understand the handicap, their own fear may also diminish. The lack of explanation and understanding of the actual etiology of the handicapping condition which afflicts their brother or sister is indicated as being a significant source of confusion and a basis for fears and fantasies about the handicapped child. The results of one study indicated that over 50 percent of these siblings later go into a helping profession.

III. Mother-Child¹

After birth, the infant loses the comfort and protection of the womb. His nervous system is unprepared for what he is to face. The mother is faced with the task of protecting her child from too much stimulation. She keeps out noise, handles him gently, and allows him lots of sleep and easily obtained nourishment. Without this protection, the child withdraws and builds his own system to reduce the stimulation. This is thought to be a possible cause of autism.

¹As viewed through the framework of Margaret Mahler.

The child may begin as hypersensitive or hyposensitive. The hypersensitive child may reject stroking and cuddling. The mother may interpret this as a personal rejection and quit trying. She may leave her baby in the crib to pacify him. The hyposensitive child responds to little. No matter how hard the mother tries, she can elicit no facial response. She, too, may leave her child in the crib, thinking that he is at least comfortable there.

The mother is also faced with the task of satisfying the needs of her child. These include eating, sleeping, and positioning the child comfortably in space, all of which can be difficult with a handicapped child. The standard way to position a child is over the shoulder, molded to his mother's body. However, it is advisable to allow the child to formulate his own system which can later be modified. For feeding, the child's head must be kept vertical so that the food can go down easily and smoothly. This can be a difficult task. It may help to build an extended chair out of a box, pad it with foam, and brace the child's trunk or midriff with a towel. This will free the adult's hands for feeding rather than struggling with maintaining the vertical head position.

The third task is for the mother to gradually introduce the child to frustration. If this is not done early, the child will never learn to tolerate frustration.

In order for the child to survive, there must be a symbiotic relationship with the mother from 2 to 6 or 8 months. This period when the two become one is referred to as fusion. Body contact is good for developing fusion. Hold the child in your lap in his favorite position. However, if this is an intrusion into his highly defended autistic orbit, it may cause a violent reaction. If this happens, start by simply putting your arm next to the child while he is in his crib, working up to gentle stroking, thereby gradually desensitizing the child. If a child experiences fusion too strongly, and for an extended period of time, alternatives may have to be gradually introduced. One alternative is to keep in constant verbal contact when not in physical contact. Every few minutes talk to the child and reassure him. Another alternative is to leave an object with the child whenever leaving him, so that he is reminded of you.

Eventually the child will have to be on his own. He will have to realize that his mother is still there even when he cannot physically feel her. One way of accomplishing this is to put the crib where the child can hear his mother without actually feeling her. She can come to him at regular intervals to pat him and reassure him. When she eventually leaves him alone, she can place all of his favorite items within his space.

By 8 months of age, the child recognizes his mother and reacts to strangers. For around 3 months, it is expected that the child will panic

whenever he is left alone. This is a positive sign to watch for since it indicates that the child has become aware of his surroundings.

Around 10 to 15 months of age, the child begins his practicing or "hatching" phase. He barely even notices that his mother is around. He is so involved with his own emerging autonomous functions that he cares nothing about what those around him are doing. About this time, the child begins to see his mother as two different people -- a "good" person who loves him and a "bad" person who is always interrupting him. This is when his mother begins to tell him "no" about some of his new ventures.

Somewhere around 14-21 months, the child realizes that with all of his new power and skill he may have ventured too far. He gets scared and returns to clinging to his mother. He needs reassurance before he can go on with his exploration. If his mother has been enjoying her freedom and finds no time to reinforce his autonomous behavior and yet allows the clinging, the child may feel abandoned. He may decide to delay any more building of skills, since it was these skills which got him so far away from his mother in the first place. On the other hand, if the mother is so happy to have her baby back again, she may inhibit him by taking him back to his former state of dependence. This is referred to as reengulfment.

IV. Self-Stimulation

Self-stimulatory behavior is divided into four main categories: (1) self abusive; (2) stereotypic; (3) autoerotic; and (4) ritualistic-perseverative. Many of these activities begin as an adaptive behavior to satisfy some need. Often they persist after the need has been satisfied, and the child becomes fixated into the activity.

Infants spend most of their time on their backs with their hands free. The normal infant naturally brings his hands to the midline and becomes fascinated watching them. He also gets pleasure watching his hands manipulate objects. The blind child cannot fixate on his hands, and so he loses the opportunity to identify his hands as part of his body. The blind child's head usually becomes his center of self -- he brings his hands to his mouth and then up to his eyes. Rubbing his eyes produces light flashes and possibly some relief from pain.

By the time a teacher sees the child, this type of behavior is pretty well ingrained into the child's repertoire. To intervene we must do the following: (1) look at what he is doing when he is not eye-rubbing; (2) determine the cause: what is happening before it begins and what happens after it stops; and (3) quantify the behavior in terms of time and place.

If the child has fixated at the eyes, present an object first to his eyes, and proceed to work the object away from the point of fixation. Move the object to his mouth for investigation, and then move it to his chest area for manipulation. Finally, move the object from the child's body onto a surface, and from there onto the floor.

It is important to move the child from the supine position. One suggestion is to place the child on a prone board, binding him with a beach towel if he is still too flaccid to hold himself, or if he reacts violently to being placed there.

If the problem is eye-flicking, there are several things which may be tried. Blocking out the light in the room creates a false environment and does not teach the child how to deal with the real environment which he must eventually encounter. When an object is introduced to a child, I choose to allow the child to flick with it for a while. Then I intervene in order to introduce a different way the object might have a function for the child.

If you decide to extinguish an activity, be sure to give the child an alternative. The criterion for extinguishing an activity is the extent to which it is disturbing the child's observation, perception and integration of the world.

Head shaking and banging and body rocking provide strong vestibular stimulation. Body twirling is an activity from which the child gets proprioceptive feedback about his body. This may be necessary in order for him to be aware of his body in space without the use of vision. Gross motor exercises as well as body rubbing in a very structured way may help give the child this awareness. Putting a hat which has been weighted on a child may help him locate the top of his head and may contribute toward his body orientation.

If the child engages in head banging, restrain his head from behind, strongly supporting his body with your own. Try to provide a substitute release for the aggression. If head banging is just beginning to evolve in a child, try to determine what has been happening to the child that might have caused such an action. If you understand the reason for an activity, you will be better able to deal with it appropriately.

Inappropriate laughter or crying is another activity which frequently occurs. If, for example, a child falls and laughs rather than cries, it may be that he has never learned the appropriate response for the situation. Appropriate affective responses in a society are learned responses. These children may have to be taught which response to use, in addition to being given the language which is appropriate to the situation.

V. Sensory Development

If the sensory systems are viewed as developing sequentially into a hierarchical system, the first sensory system that is meaningfully activated is gustatory. This sensory input is received through feeding which is the first activity in which the child is actively engaged. The child receives vestibular stimulation providing information about balance, location in space, and gravity positioning. Tactile stimulation is next, followed by the development of kinesthesia and stereognosis. Kinesthesia is the memory of motor movement. Stereognosis is the memory of three-dimensional forms which is usually acquired through vision. For the blind child, touching and feeling will have to replace this sense. To get the idea of the whole object, he must experience each part of it. If the object is very large, he must climb it, slide on it, or experience the total some way. The next sensory input is vision. This sense is very abstract and sophisticated. The last sense to be fully developed is audition.

As mobility increases, the visual process becomes more complex, and more highly developed. If there is a lesion in the nerve fibers leaving the eye, this will interfere with visual stimuli arriving at the brain, and may result in partial, unclear, or fluctuating visual information. Every effort must be made to encourage the child to use his residual vision as effectively as possible. When the nerve fibers from the eye arrive at the occipital lobe, an awareness of the stimulus input occurs. But not until the next stop -- the association area of the brain -- is meaning associated with the stimulus. Damage at this level may result in a variety of perceptual problems, such as: objects appearing upside down and letters backward, or the absence of figure-ground discrimination.

The last sense to fully develop is audition. The infant first gives a startle response to sound. If the child is frightened, he may develop a negative attitude about sound and attempt to shut it out. The infant then responds to sound by searching. Around 28 weeks, the normal infant is able to locate sound when it is presented at or below the level of his ear. This is important to remember when presenting the sound stimulus. By 32 weeks, the normal child can localize sound correctly wherever it is presented.

ORIENTATION AND MOBILITY FOR BLIND CHILDREN

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It is our thesis that the basic need of the blind individual who lives in our society today is to acquire skills which will help him to function effectively and comfortably. We feel that as each blind person develops skill in communication with sighted persons in his environment and as he receives training in the basic skills in orientation and mobility it becomes easier for him to meet the challenge of the day-to-day problems of living in a society largely geared to sighted persons. The matter of getting around physically is not the whole problem for the blind individual. It is, after all, the whole person who ultimately moves out into society.

Finally, we feel that the blind person has the same basic needs of all people. These needs are to achieve feelings of adequacy, competency, and self-esteem. We realize further that under pressure and with occasional feelings of inadequacy the blind person like the person who sees gives off cues that he is a capable, competent person and other people in turn perceive him as a capable, competent person. We professional persons are apt now and then to forget this basic need. A positive feedback from other people is essential to healthy personality development. With a realized and demonstrated self-confidence there is greater likelihood of successful functioning in all phases of his school life and his participation in the future world of work.

To achieve maximum, effective functioning, an individual must utilize three main components; mind, personality, and physical appearance. Certain people have a tendency to emphasize the mind, thus perhaps ignoring contributions which might be made through personality and appearance. The emphasis on the training of the mind only may present an escape and prevent people from having experiences which will allow for their total development. Many times individuals who function in this way are not really prepared to meet life with all of its complex demands.

When we consider that some of the greatest problems confronting blind persons are in the area of physical movement as well as social relationships, it would seem quite natural that an emphasis on intellectual development might provide an easy escape for the blind person, an escape which is gratifying to him and acceptable to the sighted persons in his environment.

I. Skills Which May Help the Blind Person Function More Effectively in His Environment

The following brief description of effective ways of functioning within the physical environment and moving freely and safely from one place to another represents those techniques which have been found helpful by those who have worked with both blind children and adults. Certain of them may be taught as the situation arises and as the blind child shows interest in improving his moving about and controlling his environment. The teacher, however, has an obligation to study the child's needs and to show him the best and most comfortable way of functioning. There should be definite times when there is a conscious effort to bring the mastery of many of the skills in orientation and mobility to each blind child in the school regardless of his ability, his visual problem, the history of his blindness or the emotional problems that the child might be encountering. When the child is ready for more independent travel, the school has an obligation to find the service of a qualified person employed on the staff or to secure this service from some cooperating school or agency competent to provide quality instruction in an independent mode of travel. This service might be provided or secured on either a part-time or full-time basis, depending upon the number of children served.

Orientation and mobility are two separate terms but they are both highly related. If a blind person, for example, is not well oriented in his environment, he cannot be expected to become effectively mobile. In other words, we cannot expect mobility without orientation.

The blind person has three possible ways of achieving mobility. These ways, which are often referred to as modes of travel, are:

1. The use of a sighted guide
2. The use of a dog guide
3. The use of a cane

The last two modes of travel represent ways by which a blind person may be expected to function independently, recognizing those times when he needs to secure certain additional help from those who see. If either of the last two modes of travel have been well taught, they will presuppose good orientation and mobility techniques. If this training has been of the highest quality, it should make it possible for a blind person to achieve the goals of his school life and his occupation or profession with a minimum of additional help in these skills from sighted persons. Those responsible for the educational program should recognize that the ultimate selection of a mode of travel should rest with the blind person who has had access to good counseling

and information based upon his performance in his earlier orientation and mobility skills as well as the demands of his present and contemplated activity in the world of work. The appropriate personnel in education will thus be called upon to have an objective attitude toward both the problem and the assets of either of these modes of independent travel as related to the intellectual and emotional factors of the blind person who acquires the best possible training and enjoys comfort and pleasure in the mode which has been undertaken and ultimately used by him.

The educational personnel will also be acquainted with the fact that not every blind person would be equally successful with the use of the dog or the cane. Some of the best guide dog schools point out that the percent of blind persons who can and should use a dog as a guide becomes quite small in terms of the total population of blind individuals. Information concerning these facts as set forth by the various schools, as well as other considerations, should be made known to the older pupil who is looking forward to a life as an independently functioning young person. Such information is available and should become a part of the files in any school which accepts responsibility for counseling and guidance of its youth.

You will experience and observe certain techniques which we hope will help you to the extent that you will not only verbalize the information that you have concerning blind persons but you will give off cues that are a greater indication of your belief that blind individuals can learn these difficult but important orientation and mobility skills according to their ability and your ability to help them acquire these skills.

A. Following a Sighted Guide

1. The blind person lightly grasps the sighted guide's arm just above the elbow.
2. He or she should follow a half-step behind the guide so that he will be able to anticipate movements such as stairs, curbs, doorways, etc.
3. Rounded surfaces should be approached at right angles (curbs, stairs).
4. In areas of narrow width or in crowds, the guide should push his elbow toward the center of his back, and this will indicate to the blind person to fully extend his arm to permit him at least one full step back and almost directly behind the sighted guide.

B. Control of Situation by Blind Person

1. It is natural that some sighted persons instinctively desire to help blind persons in many of the situations of daily living, either by helping them to secure objects in the environment or by actually helping them to move from place to place. It is frequent that the desire to help tends to cause certain sighted persons to act immediately without asking the blind person what type of help might be most useful. On some occasions, the blind person may be forced to react immediately to the sighted person's well-meaning but abrupt attempts to help. The situation most often encountered in this respect is when the sighted person acts in fright, attempting to propel or take the blind person's arm and push him into unknown areas. Sometimes this attempt is made when help is needed; therefore, the blind person may have to react in haste in order to control the situation. In any case, it is the blind person who must have immediate and continued control of the situation. Often his first acts to establish control are purely physical ones, until he can explain verbally to the sighted person the nature of the help which he needs, or perhaps that he does not need help.

The following two techniques serve as examples which should help the blind person control the situation physically and interpret whether or not help is really needed:

- a. Limp Arm: the method used when no help is needed or you desire to remain in the same location because you are waiting for someone to meet you is as follows:

As the blind person is grasped by the arm to be propelled, he completely relaxes that arm while the body and feet remain stationary. As the grasped arm becomes elevated to shoulder height, he faces the sighted person and says: "If you don't mind, I would prefer to remain here as I am waiting for someone."

- b. Hines Break (Grasping person's elbow): method employed to reverse the sighted person's efforts to propel into the preferred method of following a sighted guide. This method is employed when you desire assistance:

As the blind person's left arm is grasped to be propelled, his body and feet remain stationary while permitting the left arm and elbow to

be pushed ahead of the body. With the right hand, reach across the front of your body and grasp the sighted person's wrist, pulling his forearm forward. At the same time, free your left arm and in one motion bring it behind the sighted person's arm and then grasp his elbow. You should now be in the proper position to follow a sighted guide.

2. When offered assistance by a sighted person and he says, "May I help you across the street," reply, "Please, and if you don't mind I would prefer to take hold of your elbow as it is easier for me to cross that way." While saying this you make contact with the sighted person's arm, with your forearm perpendicular to his body (parallel to the ground).

C. Techniques Which Provide More Effective and Safer Functioning in the Environment

1. Hand and Forearm Across the Body

The forearm is held approximately shoulder height and parallel to the floor, forming an obtuse angle with the upper arm. The fingers are extended with the palm outward.

2. Locating Dropped Articles

Upon dropping an article on the floor, listen intently for the sound when the object strikes the floor, and try to determine if it rolls any. Face directly at the point of the sound, then stoop down to where the sound was last heard, and with palm down, use a widening circle until the object is located.

3. Bending Over the Objects

In bending over, the arm and hand should be used for maximum protection of the face and head, fully extending the fingers with the palm of the hand away from the face, having the hand and fingers clear a path for the face and head, thus giving the security that in squatting straight down one does not have to worry about the face striking an object.

D. Sound Evaluation and Interpretation

Develop situations that encourage each child to learn and use sound

clues. Have him listen for sounds in his classroom, the resource room, auditorium and other places where he can gain skill in recognizing and using these sound clues. Use main halls, wide places at end of halls, exits, lavatories, etc. His movements about the school should be studied and reacted to in an effort to determine sound locations and the use that he makes of this knowledge. By studying the functioning and reactions of the child in all these situations and others, the teacher is able to help the child evaluate and improve his own skill as well as gain important information when he is uncertain in a location.

II. Orientation and Mobility Terms

The following terms are presented in order that you may understand the language of the orientation and mobility instructors, and follow the instructions which are given during the course. They are presented here only because they define techniques which you will use and try to help others achieve. They are not, therefore, to be memorized or worshiped as terms, but rather to be thought of as representative of skills which you may learn first by using them, and then as a means of observing the work of the other students and children for the purpose of interpreting what you have observed in progress and problems which need greater attention.

The terms as presented here have been used by the orientors working with blinded adults at the program for blinded veterans at Hines Hospital. They are presented to hasten your communication and your accomplishments.

1. **TRAILING:** The act of using the back of the fingers to follow lightly over a straight surface (e.g., wall, lockers, desks, tables, etc.) for one of the following reasons:
 - a. To determine one's place in space
 - b. To locate specific objectives
 - c. To get a parallel line of travel
2. **DIRECTION TAKING:** The act of getting a line or course from an object or sound to better facilitate traveling in a straight line toward an objective
3. **DIRECTION INDICATORS:** Refers to any straight-lined objects whose surface lines, when projected into space will give a course or line of travel in a given direction or to an objective

4. **GUIDE LINE OR SHORE LINE:** The point at which two surfaces meet forming a line or direction, being done in tactually perceptible differences of either plane or texture of the walking surface which indicates direction or location
5. **LANDMARK:** Any familiar object, sound, odor, temperature, or tactual clue that is easily recognized and that has a known and exact location in the environment
6. **RUN:** The term used to denote a course or route mapped out and traveled to a given point or objective -- as a "run down to the bakery" or "The Twentieth Century has the run between Chicago and New York."
LESSON: might also be used to describe the term
7. **SOUND LOCALIZATION:** To determine the exact bearing or line of direction of the source of a sound
8. **SQUARING OFF:** The act of aligning and positioning one's body in relation to an object, for the purpose of getting a line of direction and establishing a definite position in the environment
9. **SIGHTED GUIDE TECHNIQUE:** A blind person lightly grasping a sighted guide's elbow in taking a walk
10. Mobility terms to be used and understood are: NORTH, SOUTH, EAST, WEST, RIGHT, LEFT, RIGHT ANGLE, PARALLEL, VEERING TO ONE SIDE, SQUARE CORNER, UP, DOWN
11. **ORIENTATION:** The process of utilizing the remaining senses in establishing one's position and relationship to all other significant objects in one's environment
12. **MOBILITY:** The term used to denote the ability to navigate from one's present fixed position to one's desired position in another part of the environment
13. **CLUE:** Any sound, odor, temperature, tactile stimulus that affects the senses and can be readily converted in determining one's position or a line of direction
14. **DOMINANT CLUE:** Of the maze of clues that are present, the one that most adequately fulfills all of the informational needs at that moment

15. INFORMATION POINT: A familiar object, sound, odor, temperature, or tactual clue, whose exact location in the environment is known but is more difficult to recognize or perceive than a landmark

III. Teacher's Responsibility for Orientation and Mobility Skills

Your attitude as a teacher of blind children and your interpersonal relationships count as you attempt to help the blind child develop good orientation and mobility skills. Can you grow in your ability to observe the blind child as an individual? Can you strive for a continuing positive relationship with him which helps him to feel comfortable in talking with you about himself and in sharing with you the ways which he has found to gain information from his environment and to move out in it? Can you, therefore, draw from each child in order to use his information as a basis for your understanding of his skills and his problems? As you are able to gain information from him, you will be able to rely on his judgment and provide support for him as he faces certain of his problems. You will then be able to judge the effectiveness of his evaluation of certain clues in his environment and respect his feelings concerning his desires, his fears, and his need to feel successful and useful as a person.

You will recognize that this is his school and that his happiness and success in it will depend to a great extent upon his understanding of the buildings and his comfort in moving from place to place as he pursues his daily activities. He will need to know the relationship of his classrooms to other important rooms as the cafeteria, the washrooms, the auditorium, and the important entrances and exits. These he will need to know in relationship to each other, and as he has need for this information, not as a learned, enforced exercise of information that may not have value for him. As in all other important skills that children acquire, you will recognize that progress occurs gradually and it varies with each child. As each child functions more effectively within his own school building, he moves to other school buildings and to the playground and the larger community. If mastery is related to his total functioning and if it is based upon as much knowledge as we can have of the techniques related to the child's understanding of them, there will be no shortcuts to success. If progress is forced with new techniques undertaken before previous steps have been mastered, you may indeed impede progress and provide frustration for the child.

You as a good teacher of blind children recognize that you are helping the child achieve his success, not yours as a teacher. You will also recognize

that it will be easier for the child to appreciate his success and use his skill in a school and at home if others also recognize the value of this skill to him. All of his teachers should encourage him and should provide support and praise as they observe progress. If possible, members of the family should understand certain aspects of the program in order that they may be more resourceful in providing greater interest in independent functioning and in finding ways of making the larger environment more interesting and rewarding for the blind child. The family needs the support of you, the good teacher, often even more than the child does.

The following suggestions should help the child develop skills necessary in good orientation and mobility:

Helping the Child Understand His School

1. A general familiarization of the school building: floors, stairways, own room, auditorium, washroom, etc.
2. Emphasize the need to develop an awareness of his environment by seeking from him: information as to his knowledge of the many clues in his environment, the type of clues, source of origin of the clues, and the use of these clues for orientation and mobility purposes.
3. Equip the child with some basic hand and arm techniques which will enable him to move safely, efficiently, and confidently and thereby begin to establish a success pattern.
4. Make the first runs simple, utilizing methods that will ensure success such as: squaring off, straight lines, right angle turns, trailing as much as possible.
5. Keep the runs simple at first and the return trips just the reverse of the going trips.
6. After the child understands thoroughly, executes properly, and begins to appear bored with the simplest of techniques, then permit him to try rounding corners, a minimum of squaring off, less trailing, etc.
7. In areas of incompetence, determine the cause. Was it due to:
 - a. Neglect of awareness of clues; poor hearing; not aware of

terrain (slopes); ignored odor or temperature changes; preoccupied with other stimuli

- b. Poor or improper interpretation of clues; inability to seek out dominant clue
 - c. Poorly oriented (may feel he is in a different location or area)
 - d. Use of poor or improper skills; did poorly in squaring off, direction taking, etc.
 - e. Forgot his run, turns, or distance
8. As you notice areas of competency, primarily in the initial stages or under difficult situations, ask him to describe how he did something, how he knew something. This reassures him that his selection and interpretation of clues was good, and he should be encouraged to use the same clues whenever they are present.
 9. Study and evaluate his functioning in many situations with a view toward safer and more efficient functioning in both orientation and mobility skills.
 10. Where it is at all possible, arrange for individual conferences with the parents of the child with whom you are working. They need to know what he is achieving in understanding his school and functioning effectively in it, just as they need to know how he is succeeding in the subjects and other characteristics that are listed on the reports to parents from the school. Some schools have found it helpful to set up group meetings for parents whose children are new in the school; such special meetings can offer to make available information concerning the more simple orientation and mobility techniques. These meetings should not be forced on parents, nor should such meetings be the means of trying to organize parents' groups. There seem to be many groups already organized to which parents can turn for broader knowledge and current information. If such groups are organized, they would seem to be more effective if the parents, like their children, have some readiness for the experience and can show a real desire for help. Often this level of readiness can be judged first through individual conferences.

11. As the child is able to move out of the school situation and increase his functioning in the larger community in the city where the school is located, it is highly desirable for the person who is providing the orientation and mobility skills to actually give some individualized instruction at the home, providing the child lives in the city, and at many other places to which he will be going, all of which should be in relation to his home and school.
12. It is to be hoped that the instructor in charge of orientation and mobility where blind children attend residential schools will have the time, the flexible schedule, and the funds available to make it possible for students to develop greater interest in the community outside the school and the relation of the school to transportation points which are used when the student visits his home or his friends outside the city. It is hoped that the administration of these schools can plan again a sufficiently flexible schedule so that the mobility instructor can observe the children frequently as they are functioning off the campus in order that the problems can be studied and that even certain failures can provide good learning experiences. The goal is to continue the interest in utilizing good skills and moving into more complicated environments.
13. It seems highly desirable that the person responsible for helping the blind student achieve greater orientation and mobility skills conduct brief sessions or small group meetings with all of the teachers to share with them whatever information might enlist the interest of all of the teachers in the importance of cooperation of all of the staff in helping the child by providing support and inspiration as the child develops skill. The residential schools are in a good position in this respect to share this information with their entire staff since they find it easier to get together for meetings within the smaller school structure.
14. If you understand the terms of basic orientation and mobility skills used by the mobility instructor, you will be able to help the child move into his first lessons with the mobility instructor much more easily and will no doubt contribute to his readiness for this important instruction as well as his interest in it and desire for it.
15. If you understand some of the problems relative to congenital blindness, you will describe for him and evaluate with him his understanding of directions. You may have to try many different approaches and provide many more actual experiences which will help him move with greater ease and explore new situations which help him become more

inquisitive and less fearful. An adventitiously blinded child will have some visual frame of reference.

16. Your cooperation and support of the child receiving orientation and mobility instruction is of great importance both to the child and the success of the instruction because the orientation and mobility instructor is a vital member of the team. Your continued evaluation and honest questions as you work with the orientation and mobility instructor will be as important to the child and his family as any subject you teach directly.
17. You will above all continue to be interested in the research in this area. To develop charts, maps, and graphs as well as any other specialized material which will bring the child closer to his environment is important.